THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XVI. No. 374—19th YEAR.] LONDON, FEBRUARY 19, 1867. [Subscription per Ann. { 15s. in Advance / 18s. Credit.] DOUBLE No. Price 1s.

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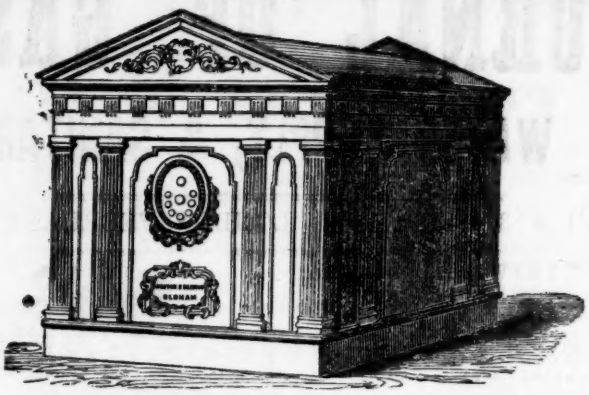

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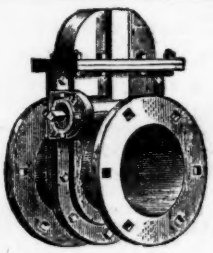

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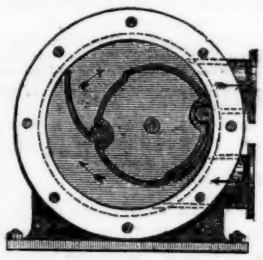

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☞ *See "Practical Mechanic's Journal," Dec.* 1, 1865; *also, p.* 711 "JOURNAL OF GAS LIGHTING," *Sept.* 18, 1866.

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It is worthy of remark, that the only two other Firms who receive Awards *both manufacture imitations of Thomas Glover's* Patent Dry Gas-Meter, and the reason given for these Awards is *"construction* and sound workmanship." Thomas Glover, therefore, claims that the *construction* of his Meter has obtained *three Awards from the Jury of the International Exhibition of* 1862; at the same time, *contrasting* the Award granted for his Meter by the words, *"For excellence of manufacture, as regards Dry-Meters."*

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

O. P.—*Unstamped meters may continue to be used after Oct.* 13, 1870, *in counties and places which have not adopted the Sale of Gas Act.*

ERRATUM.

At page 68, second column, for "*the proportions being* 18*s.* 4*d. to* 4*s.* 11*d. per ton*," read "5*s.* 11*d. per ton.*"

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 19, 1867.

Notes upon Passing Events.

Mr. Henry Cole's suggestion that subjects should be discussed at the Society of Arts without the formality of a written paper is not likely to be followed, after the remarkable failure of his own specimen discourse. That Mr. Henry Cole is capable of producing a very interesting and useful paper on any subject he takes up, no one who has watched his career can doubt. That he is much too busy to prepare a paper on any subject, no one can be surprised to hear. But to adopt his suggestion would be to bring the discussions at the Society of Arts down to the level of Coger's Hall—to make it an arena in which the busy, the idle, and the conceitedly incompetent would bestow their loose ideas. One great point of the Society of Arts papers is, that they are not only written, but printed, before they are read. These two processes protect the society from a great deal of inconsequent verbiage. No man knows what he knows about any subject until he has written down what he has to say. Many think they know a great deal until they put a sheet of paper on a desk and take a pen in hand. A practised orator will be amusing, if not instructive, on every question that he takes up; but Mr. Cole is not an orator, although a very shrewd man, and the consequence was that he only spoiled a very good subject. The question of London cabs and cab fares wants discussing, and it should be discussed where cab-owners also could have their say—and cab-drivers too. Another committee of the House of Commons might once more examine the whole question with advantage. It is a fact that the cabs in Birmingham are better than those of most other towns; but it is odd that it was not noticed that all, or nearly all, the good cabs in that town are Hansoms, and made on an excellent pattern, peculiar to the town. But it is useless to compare the London cab system with any other, because the initial conditions are so totally different. London is so vast that you cannot have fares by the "*course.*" It is so subject to rain—and, consequently, mud—that open carriages like the Victorias of Paris would not pay, for they would have to lie idle half the year. They were in use in Leamington thirty years ago, but have quite gone out. The vast distances of London made the mileage system inevitable and also mysterious. We have no faith in the working of any automatic mile-measuring machine. To be effective, it must be very expensive, and even then it would be subject to disarrangement. A much simpler plan would be for every cab to be provided with a good watch, as time is a very fair guide to distance, and it would be an indisputable standard for both parties. We quite agree with Sir Cusack Roney that the cab-drivers of London are a much maligned class. As a general rule, they are civil and honest; they drive much faster than in any other city, and are usually content with their fare in the day-time, when it is a shilling or over. But in London cabs are taxed too high, and compelled to accept too low a fare for the first mile, and at night. We really cannot see anything to find fault with in Hansom cabs, except that the London build is often too narrow for stout couples. They are certainly better than the crawling pace of all Paris cabs, and as for the Paris prices, who but a resident can understand them. About the civility of the Paris drivers the less said the better; add the drink money, and for short distances they are dearer than in London. We need a reduction of taxation on the common street cab, and, as proposed by Lord Belmore in his Traffic Bill, a minimum shilling fare, with an increased fare after dark. This last regulation would encourage decent cabs to ply at night. Then the powers of the police to interfere with cabs and horses unfit for use must be enlarged. The *voitures de remise*, which are a cheaper edition of our flys, are a great advantage in Paris. There they are lodged in coach-houses facing streets which are made in the universal blocks of buildings. Here we have no room for them to stand. But if the Legislature were to favour such vehicles, it would be well to have at every cab-stand a pillar with the announcement of where superior cabs at a shilling a mile, or any other price, were to be had. Mr. Cole's idea that cab-owners might charge what they please would lead to perpetual disputes at night, at railway

stations, and places of amusement. A better plan would be to license two classes of prices, and make each of a distinctive colour on the panels, with suitable coloured lamps at night. It must be remembered that the wear and tear of wheeled vehicles in London is tremendous—at least 25 per cent. more than in any other city. Find out the lowest fare at which a dozen decent vehicles will make a profit, and then you have a figure on which to found legislation. At present the fact that capitalists are withdrawing from the cab business, and that it is falling into the hands of poor men, who own and drive one cab, proves that it does not pay well enough to be well done. Something useful might be done by raising still higher the condition of the watermen; increasing their salaries, and making them bound to give information as to fares and distances. Let every waterman be provided with a quarto or folio edition of cab fares, and a good map; give him an office, or sentry-box, and paint on it in conspicuous letters, "Information as to fares given—fee, 1d." Such fees would make it worth the while of the waterman to be attentive to this new duty, while no reasonable person could object to so small a tax. It would be another simple aid to cab passengers, if the distances from Charing Cross in miles or half miles were written in all the main thoroughfares. Information made easily accessible will be more useful than penalties. Why should not every policeman carry a map of London divided into half-mile circles. There are few disputes at railway stations, because an inspector is generally there ready to state the real fare. It has been correctly observed that, good or bad, we are better supplied with cabs—and cabs, too, that rival private carriages in pace—than in any other city; but as cab-owners make poor profits under present taxation, it is not surprising that there are so many vehicles both cheap and nasty.

The other parts of Lord Belmore's Bill for regulating the street traffic of London are better intended than practical. It is too early to make fixed rules. The expedient of an Act has been resorted to because of the jealousy between Sir Richard Mayne and the Corporation of the City of London. Sir Richard has his merits, but his temper is fatal to his efficiency. He is essentially a martinet, and one who disdains to be taught even by experience. If we could amalgamate him with Mr. Walpole, out of the two characters a very decent chief of police would be made. The City plan was better. Rules to be made from year to year, and only applied by leave, when sanctioned by the Secretary of State. But then the application of the Bill was too limited, and there was no central authority whom all the metropolis was prepared to trust with discretionary powers. At any rate, there is a chance of getting rid of vans, brewers drays, coal carts, timber wains, and railway girders, stopping the way. Shall we, after all, have to appoint a prefect for the whole metropolis? With a more teachable conciliatory man than Sir Richard Mayne we should not despair of seeing the City police abolished.

Her Majesty's Government seem to have determined to do justice to the nursery rhymes, and make us all cry after the Queen's Speech—

"Wasn't that a dainty dish to set before the king."

The Bill for "the Improved Accommodation of the Sick Poor of the Metropolis," and the inquiry into the working of trades unions, are alone morsels both tough and piquant enough for one session. Liberal journals which had been patient for long years with Mr. Villiers's ill-tempered indifference, became suddenly filled with burning zeal for workhouse reform when Mr. Hardy came into office, and were quite unwilling to wait for the opening of Parliament. It is now made plain that the new Poor Law Minister has not wasted his time. The measure is very comprehensive, and has all the materials for being shaped into a satisfactory Act of Parliament. The Bill applies itself to improved classification of metropolitan paupers, the supply of more cubical space, and better ventilation. The minister did not like to own his obligations to the *Lancet*, and other "sensational writers;" but that is natural. All officials use and dislike these censors of the press. Mr. Hardy took the sick, imbecile, and children at 34,000. He proposed to place all the imbeciles in appropriate establishments, to remove all the children above two years of age to separate schools, to provide new accommodation for 2000 lunatics, and for 700 or 800 small-pox and fever patients. In order to provide for the remaining sick poor he proposes to create a new separate board of management, one-third of the members to be nominated by the Poor Law Board, and selected from persons resident in the district and rated at not less than £100 a year. These special infirmaries to be used as means for training sick-nurses and educating medical officers. Better attention to the out-door sick is to be secured by the establishment of central medical dispensaries, for which the medical officers shall, instead of making up their own medicines, give prescriptions. All the ten local Acts affecting the poor of the metropolis are to be repealed, and it is to be placed under the Poor Law Board. Mr. Hardy does not propose to equalize the metropolitan rates, but to throw upon the common fund the charges for lunatics, fever and small-pox patients, medical officers, dispensaries, medicines, registration, vaccination, and the maintenance of children at school. These will be great reforms. One of the greatest will be the improvement in attendance on the sick poor. There will be more house to house visiting. The medical officers, relieved of the drudgery of preparing medicine and of the degradation of making a profit out of it, will become responsible through their written prescriptions; while the sick will be saved much loss of time by the central dispensaries. The children will be benefited by removal from contact with paupers. At the same time the guardians will retain their control over the relief afforded to the able-bodied. These reforms will probably extend beyond the metropolis. It will not be a long step to place some of the fixed charges on the consolidated fund.

The sanitary arrangements of the City of London are amongst the departments best managed by that municipal government—indeed, they are the best managed in Europe. The cause of this excellence is not far to seek. The active measures are under the control of two officers—an engineer and a medical man—far above the average in activity and ability, and the Commissioners of Sewers have the good sense to allow them a large discretion, and vote liberally the funds needful for improvement and administration. Dr. Letheby's last report is full of matter that may be usefully studied by the governing authorities of every great city in Europe. Within eleven years the inspection of houses in the City of London has risen from 5400, in 1856, to 12,200, in 1866; and in the same time the orders issued for sanitary improvement have increased from about 1200 to over 3000. In 1856, the sanitary work of the City was done by the six inspectors of pavements, who devoted a comparatively small portion of their time to this work. But, in 1858, on the recommendation of the Medical Officer of Health, an additional sanitary officer was appointed, with the sole duty of inspecting and reporting on common lodging-houses. Rules and regulations were drawn up and enforced for their management. In 1864, a further step in advance was taken; a complete change was made in the mode of performing the sanitary work of the City; officers were appointed whose sole duty was to attend to the sanitary business of the City. Still, with three inspectors, there were frequently just complaints of the intervals which elapsed between the inspections of the poorer class of houses, which are not less than 4000 in number. Finally, in 1866, the City was divided into four equal districts, with a sanitary inspector for each. The results of this close attention have been very striking. The Sanitary Act of 1866, not only requires a constant supervision of the houses of the poor, but enlarges the definition of a "nuisance," and adds to the power of local authorities in dealing with it. Previous to the passing of that Act, the word nuisance merely applied to such a state of premises, ditches, gutters, water-courses, privies, urinals, cesspools, drains, or ash-pits, or to any animal so kept as to be a nuisance or injurious to health; but now it includes any house, or part of a house, so overcrowded as to be prejudicial to the health of the inmates; or any factory, workshop, or bakehouse not kept clean, or ventilated, so as to render harmless any gases, vapour, dust, or other impurities likely to be dangerous to health; also black smoke from any workshop. Under this Act, where local authorities neglect to do their duty, the police can be set in motion by one of the Secretaries of State. Local authorities have also large powers for cleansing and disinfecting houses, clothing, and bedding; for providing carriages for the conveyance of persons suffering from infectious disorders, and for the removal of dead bodies from rooms in which persons are living. The powers for regulating lodging-houses are much enlarged. The result of these practical steps for making and keeping the City and its inhabitants more clean, is shown in a marked diminution of the death-rate. The mortality from the diseases connected with cholera has declined in a steady and remarkable manner. In the first six years recorded it was at the rate of 64·2 per 1000 deaths;

in the next six years, 14·2 per 1000 deaths; and in the six years just expired, 12·5 per 1000 deaths. In 1848 cholera was charged with 63·5 deaths per 10,000; in 1854 it was reduced to 19·7; and in 1866 to 9·5 per 10,000 of the population. The deaths from cholera in all London were in the same year 18 per 10,000, in Paris 39, in Amsterdam 42, in Vienna 51, and in Brussels 163. Dr. Letheby also argues, with a show of reason, that the City has stood as a barrier between the eastern parts of the metropolis, where cholera raged so severely as to cause a mortality of about 64 per 10,000, and the western districts, which suffered only to the extent of 3·6 per 10,000. Dr. Letheby concludes his report by suggestions which will apply to every crowded population. Houses built long ago, when the value of light and air was not at all appreciated—then intended for the residence of one family, and now let in lodgings to the poorest class—and others situated in narrow courts and alleys without a breath of direct ventilation, and where the foul gases generated by filthy habits have no means of escape but by slow diffusion, "will "counteract the best efforts at sanitary improvement. Such "houses are saturated with the filth of ages; nothing will "thoroughly cleanse them." Model lodging-houses are occupied by a superior class of persons to the labouring poor, and there is no house accommodation for those displaced by very needful improvements. But even new buildings and the most active efforts to ventilate, scavenger, and provide water will fail unless the habits of the poor themselves are improved. The poor must be taught how to use the water and the fresh air provided for them. It is not enough to lay penalties on the landlord; the tenant must be made liable to summary punishment for breaking or neglecting the sanitary apparatus provided for his use. This will be a proper subject for clauses in a revised Sanitary Act.

The progress of sound notions of commercial and political polity received a remarkable illustration in the measure introduced to the House of Commons, on Thursday night, by the Chancellor of the Exchequer, for altering and slightly lowering the import duties on sugar. In the first place, we find four great commercial countries—England, France, Holland, and Belgium—coming to an agreement for settling the *principle* on which they shall tax an article of enormous consumption. Three of these countries, first giving up the principle of Protection, involved a system of drawbacks, and finally, after a series of careful experiments on a large scale carried on at Cologne, actually changing their opinions, and adopting the system of this country, which a few years ago all the Continent agreed in considering and treating as a perfidious, devouring monopolist. Next we find the some time chief of the Protectionist party—the minister of what is foolishly called a Tory Government—introducing the resolutions for carrying into effect what is really a large measure of Free Trade, as far as principles are concerned, although the effect on the revenue may be trifling. France does not object to increase her revenues by agreeing to—nay, proposing—a measure which will greatly benefit our declining trade of sugar refinery. In these changes sound political economy and sound principles of international agreement go together hand-in-hand. It is the great republic of the United States which, while rejecting as far as possible all European productions, has taken to wear the rags of Protection cast off by constitutional England and imperial France.

The turnpike nuisance was discussed the other day by the London Farmers Club. In Scotland it has been the subject of a Royal Commission. In Wales, many years ago, Rebecca initiated a great reform. The Scotch are slow to move, but stick to their text, and they will probably show England the way to put down the turnpike-keeper and the lawyer, who now feed on the trade of carts and waggons like mites on cheese. It is estimated that, out of the funds raised by tolls, 40 per cent., or 8s. in every sovereign, go in expenses of collection. Sir George Jenkinson, who opened the subject, professes to be a Conservative; he is really only a dull, prosy country gentleman, who wants very much to get into Parliament, and who is trying all round the compass of the agricultural mind in order to get there. But, dull as he is, he stated some suggestive facts, raised a useful discussion, and learned a good lesson. The baronet and ex-captain of Hussars found not one supporter of his plan amongst the plain farmers, whereas if he had been discoursing political clap-trap some few years ago they would have cheered him to the echo, as they did that amusing mountebank, Colonel Sibthorp. All the club were agreed with him when he condemned the turnpike system under which, in his own county of Gloucester, out of £50,000 raised for the roads, only £30,000 is expended on them. That is to say, a 4d. rate would keep the roads in good order, but it would require an additional 3d. to pay the expenses of the trusts. If, contrary to the custom of the club, a vote had been taken, there would have been no dissent from the resolution that turnpike tolls are costly in collection, and unequal in their pressure. The proposition to place the turnpike debts on the consolidated fund would only have been objected to because of the impossibility of carrying such a measure. But the proposal to transfer the management to the Highway Boards was rejected with singular unanimity. The Highway Boards have few friends amongst farmers. The general opinion turned on an inquiry by a Royal Commission, to a consolidation of management, and to the levying of the expenses of the roads on those who benefit by them, not only on those who use them. It seems that the total income of turnpike trusts in England and Wales is quite insignificant as compared with the national resources—viz., £1,425,000—and the total expenditure in work and materials a little over £600,000. This is a small thing, but not less a great nuisance. Farmers can easily settle the matter if they combine, but that they never do. In one matter only do they consistently agree—in abusing their best customers, the people who live in towns.

Circular to Gas Companies.

Sir Stafford Northcote, the President of the Board of Trade, has given notice that he will, on Friday, the 22nd inst., bring in a Bill to amend the Metropolis Gas Act of 1860, and considering the great interest felt in the question by a large number of our readers, we purpose publishing a second edition on Tuesday next, with a report of the discussion on the introduction of the Bill, and a copy of the Bill itself. The form of the notice does not lead us to infer that it is proposed to authorize the transfer of the gas supply to the Metropolitan Board of Works, though the fact that a deputation of the delegates from the metropolitan vestries and parishes waited on Sir Stafford Northcote on the 13th inst. is indicative of the persistence of those bodies in their attempt to induce the Government to adopt that course. On the other hand, the vestry of the important parish of Marylebone, at a meeting held on Thursday week, protested unanimously against that power being given to the Metropolitan Board, "as it would be "objectionable to carry on the manufacture and sale of gas "at the expense of the public rates." Other parishes are moving in the same direction, and it is not at all improbable that a strong local opposition will be organized against the transfer of the gas supply to the Metropolitan Board, should such a scheme form part of the Government measure.

Since the notice in our last number of the reply of the Metropolitan Board of Works to the request by the Government to be furnished with the data on which they founded their resolutions recommending the confiscation of the property of the gas companies, we have received information respecting the prices paid by several local authorities when they purchased gas-works, which, if precedent be any guide to the Board, should alter their opinions respecting the "hazardous security" of such property. At Birkenhead the price paid per £100 share capital was £220; at Burnley, £300; at Bury (Lancashire), £250; at Darlington, £200; at Halifax, £240; at Macclesfield, £250; and at Oldham the gas company received bonds for 10 per cent. annuities. From the prices paid in these instances, it is clear that no other basis could have been taken than that of a secured income of at least 10 per cent. Most of the metropolitan gas companies have attained that rate of dividend, and there seems no reason why they should be called upon to surrender their undertakings on less liberal terms. If by the term "hazardous security" the Board intend to convey that the shareholders rights can be interfered with by new legislation, the same thing might be said if they accepted the bonds of the Metropolitan Board. If, also, there be any foundation for the assertion that gas property is "liable "to depreciation by discoveries in chemical, physical, and me-"chanical science," it is clear that the same risk would be incurred by the Board itself, who would not be justified, therefore, in entering upon so speculative an undertaking. The offer of 6 per cent. bonds in exchange for the present 10 per cent. dividends is, indeed, so monstrous a proposition that it cannot for a moment be entertained by Parliament.

Mr. Cleminshaw, who was for many years controller of the gas department of the Corporation of Manchester, has published "A Few Remarks on the Pamphlet entitled 'Metro-"politan Gas Legislation, Past and Prospective,'" in which he endeavours to point out the advantages to be derived from the transfer of gas-works to the local authorities. He contends, also, that an increase in the illuminating power of the gas from 12 candles to at least 22, may be obtained at a comparatively small cost, as the principal expenditure of a gas company consists in the distribution and management, which are the same whatever quality of gas may be supplied. In supporting this opinion he commits many egregious errors which are surprising in a man who has had any practical experience in the manufacture of gas. He assumes that the quantity and value of the residual coke would be the same, whether Newcastle coal or cannel be employed. He takes for granted that the natural store of cannel can never be exhausted, and that the supply will be always equal to the demand. But he entertains a different view of the price to be paid to the gas companies for the transfer of their works from that of the Metropolitan Board, for he proposes that the real value of the works should be paid for them, and that the advantage to be gained is to be principally derived from the concentration of management in a public body. In the concluding paragraph he notices with disapprobation that the plan adopted in Paris to secure the benefits arising from municipal management, bears too hardly on the present generation, who have to purchase the works by paying a larger price for their gas, thus taxing themselves for the benefit of posterity. It seems strange that Mr. Cleminshaw, who for many years adopted the plan during his gas administration in Manchester of charging a price to consumers sufficient to realize from 50 to upwards of 60 per cent. on the mortgage-debt, should now appear as the censor of the system which he inaugurated and practised.

The Bills of the Chartered and Imperial Gas Companies are threatened with opposition on the second reading by several of the local vestries, on the ground that, by a further increase of the capitals of the companies, the gas consumers would be deprived of the benefit of any reduction in the price of gas, to which they would be entitled whenever a larger profit was made than required for payment of the prescribed dividends on their present capitals. Parliament, in imposing on the gas companies the obligation to supply every person who applies to them for gas, is morally bound to give them the means of complying with such demands, and the increasing consumption of gas renders it necessary that they should construct additional works, for which purpose the increased capitals are required. One of the objects intended to be accomplished by one of the companies is the removal of the sites of their works from the present situations, which have been objected to, into localities where there is scarcely any population that could possibly be annoyed by the operation of gas-works. Though this object has been strongly urged again and again as necessary, the vestries now object to allow the companies the means of carrying into effect the plans that have so often been insisted upon as being necessary for the public health. For Parliament to reject year after year reasonable and well considered plans for effecting these improvements is as unjust as it is undignified. It was well pointed out by the chairman of the City Gas Company, at their last meeting, that the vexatious interference with the propositions of the gas companies has caused heavy expenses, which are not only injurious to the property of the companies, but prevent the gas consumers from obtaining the benefit of a reduction in the price of gas. The cost of opposing the Corporation Bill, which sought to completely alter the condition of the supply of gas in the City, amounted to nearly £10,000. This, he observed, "is a very "grievous infliction upon the companies, for there is not one "gas company in the metropolis the directors of which do not feel an earnest and sincere desire to reduce the price of gas as "early as they can consistently with the duty they owe to the "shareholders." The Bills of the Chartered and Imperial Companies will most probably be referred to the same committee as Sir Stafford Northcote's Bill for the amendment of the Metropolis Gas Act, which course was adopted with the metropolitan gas Bills of last session.

The Town Council and Local Board of Reading have long enjoyed the reputation of being most economical managers of the public lamps, and the lighting of the streets of Reading has often been cited as an example of the cheapness with which a town may, with proper management, be lighted. They forced the gas company to submit to their own conditions, and by means of average meter indication, regulated by a double-tap, they contrived to reduce the consumption of gas in each of the lamps to 3½ feet per hour in an evening, and to a glimmer of 1½ foot consumption after midnight. It is true the town was involved in darkness, and the limbs, lives, and property of the inhabitants were endangered; but those were minor considerations to the great achievement of reducing the payments to the gas company. Again and again have we protested against this cheese-paring economy, and shown that the average meter indication, with the regulation of a double-tap was a complete failure, but the local authorities maintained that the Reading system of public lighting was admirable, and worthy of all imitation. For some time past we have heard little about Reading and its system of public lighting, and it might be supposed that the townspeople had grown accustomed to the faint glimmer of their street-lamps, and were satisfied with the reduction in their gas accounts. But of a sudden the matter has been revived, and has assumed a new phase. The fraudulent gas company, it seems, have been surreptitiously increasing the pressure, to fulfil the requirements of their customers, and have by that means forced a larger quantity through the double-taps than they were supposed to be regulated to allow, and the meters have registered 4 feet per hour per lamp. The Town Council and Local Board have consequently taken alarm, and at their last quarterly meeting a report from the Lighting Committee was presented, stating that there had been an advance in the gas account of more than £100 on the previous half year, which, in their opinion, should not be paid. The committee assign various reasons for this recommendation, of such a character that we should scarcely have expected, even from a committee of the Local Board of Reading. It is not alleged that the quantity of gas charged in the account was not supplied, but that the company had surreptitiously increased the pressure, and thus forced a larger quantity to the burners than the intended 3½ feet per hour. It is further alleged that "there is good reason for believing that the "quality of the illuminating power of the gas has not been "satisfactory," because the company are required by their Act to supply gas of the illuminating quality of 12 sperm candles, and to do so it would be requisite to maintain a standard of 14 candles, and some experiments had proved "that that higher "standard had not been observed by the company." Though no authorized testing of the illuminating power and purity of the gas had been made, it is asserted that "there are circum-"stances which render it very doubtful to the committee whe-"ther the required purity in the gas has existed." For these reasons, therefore, "the committee are unable to recommend "the payment of that account in its present state." Thus it appears fair and equitable to the Local Board of Reading, who adopted the report of the committee, that because more gas than they considered requisite passed through the double-taps, because the illuminating power of the gas was not regularly 2 candles higher than the prescribed standard, and because the purity was suspected, that the gas supplied should not be paid for. That such principles of equity should be avowed by the Reading Local Board need not, perhaps, create surprise; but one resolution adopted at their last meeting is certainly calculated to astonish. It was suggested by the mayor, and afterwards carried as a formal resolution, that the system of average meter indication should be abandoned, and that they should return to the formerly much-abused plan of being supplied by contract at a fixed price per lamp. That there may be no doubt about the matter, we quote the words of the resolution which was proposed and carried—"That the matter be "referred to the Public Lights and Gas Committee to make "such arrangements as they may think desirable, with a view "to the settlement of the company's account; and to negotiate "with them as to the future lighting of the public lamps by "the payment of a fixed sum per lamp." Thus, after years of contention and dissatisfaction, and the expenditure of large sums of money, the plan of public lighting by average meter indication with a double-tap, which was considered the Reading system, has been admitted by its promoters to have been a complete failure, and they now want to return to lighting by contract! It is obvious that the difficulty, which has arisen from the increase of pressure requisite during the winter months, has been caused by the persistence of the Local Board in the use of the double-tap as a regulator. Had proper

pressure-regulators been employed, the difference would not have produced an alteration in the consumption of gas. The gas company have replied to the report of the committee, in a circular which will be found in another column.

The Local Board of Leamington have had cause to regret their opposition to the gas company's Bill. When the accounts came to be paid, amounting to upwards of £700, the ratepayers became enraged at such a squandering of the public money, and a bill for hotel expenses to the amount of £94 particularly excited their wrath. At a recent special meeting of the Board, in which the ratepayers expressed their opinions in no measured terms, there was a disgraceful uproar. The result has been the resignation of Mr. Wallington, the clerk of the Board, who was the active agent in promoting the opposition to the gas company's Bill.

It is quite refreshing to find a Middlesex common jury doing justice to a metropolitan gas company. An action was tried in the Court of Queen's Bench on Wednesday last, in which the Victoria Docks Gas Company sought to recover from a publican the amount due for a quarter's consumption of gas. The quantity registered by the meter in the corresponding quarter of the previous year had been 62,900 feet, but in the Christmas quarter of 1865 there were only registered 15,000 feet. On examining the meter, it was found that it had been forced out of its position, placed on a slant, and that a quantity of the water had been withdrawn, so that gas passed through unregistered. These facts were strongly against the publican, who contended, however, that his consumption of gas in the quarter had been greatly diminished, and that the meter registered the whole quantity that had passed through it. The case was so clear that it is difficult to conceive how there could have been any difficulty in returning a verdict, but one of the jurymen held out. A unanimous verdict was, however, after some delay, returned for the plaintiffs for the amount claimed.

The imputation of negligence on the part of the Chartered Gas Company, conveyed in the verdict of the coroner's jury, on the inquest held on the bodies of the sufferers by an alleged explosion of gas in a house situate in Summers Street, Back Hill, Clerkenwell, has given rise to numerous miscellaneous claims for compensation. A husband claims £500 for the loss of his wife, and a widow the like amount for the loss of her husband. Claims for barrel-organs are made by the score, and one for a performing monkey, valued at £40. The trials of the second batch of actions arising out of the fire at Saville House, Leicester Square, were to have commenced yesterday, before the Lord Chief Baron, but were deferred till the sittings after Easter Term, in consequence of the illness of a material witness.

Communicated Article.

APPARATUS FOR DETERMINING THE QUANTITY OF SULPHURETTED HYDROGEN CONTAINED IN CRUDE GAS.

[Translated from the *Journal für Gasbeleuchtung.*]

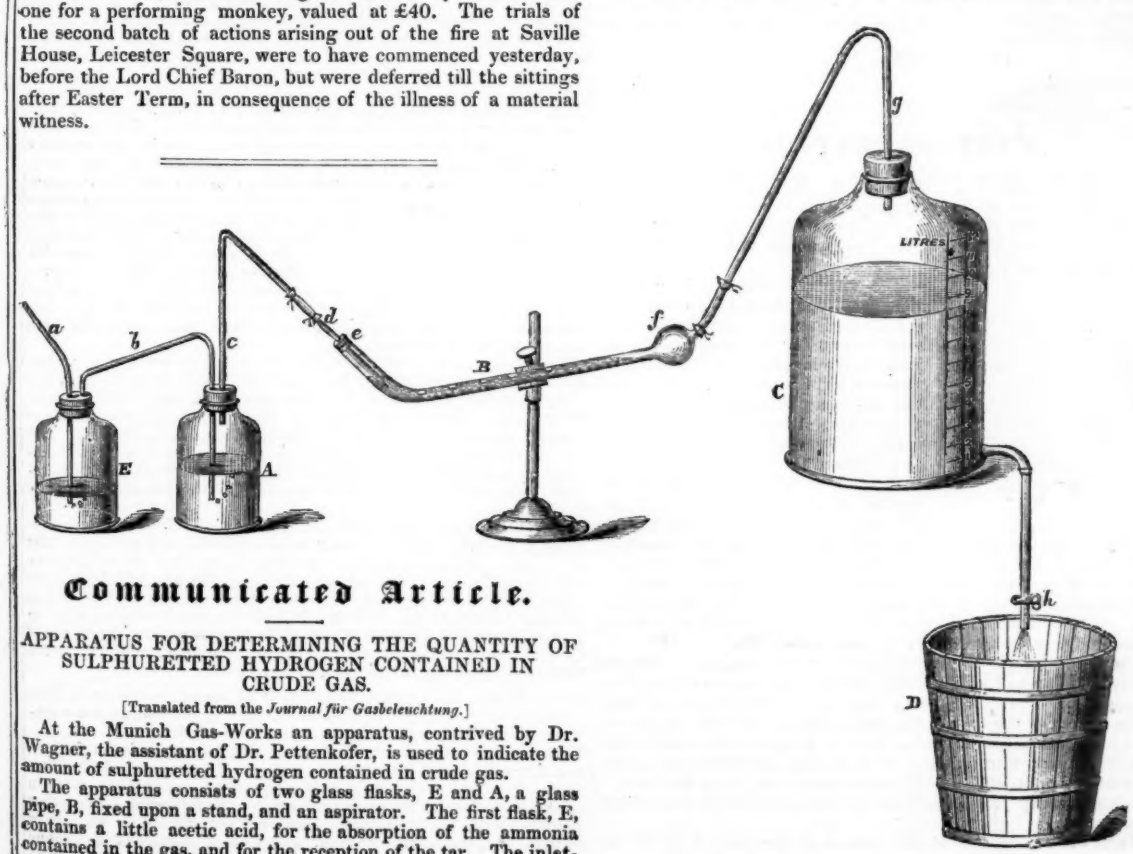
At the Munich Gas-Works an apparatus, contrived by Dr. Wagner, the assistant of Dr. Pettenkofer, is used to indicate the amount of sulphuretted hydrogen contained in crude gas.

The apparatus consists of two glass flasks, E and A, a glass pipe, B, fixed upon a stand, and an aspirator. The first flask, E, contains a little acetic acid, for the absorption of the ammonia contained in the gas, and for the reception of the tar. The inlet-pipe *a* is bent at an obtuse angle, to allow the condensed tar to flow into the flask, and after passing through an india-rubber stopper, the pipe descends to near the bottom of the flask, and dips into the acetic acid. The outlet-pipe *b*, on the contrary, does not penetrate further than to within a short distance below the inner surface of the stopper, and is connected with the second flask, A, into which it enters, descending to nearly the bottom of it, by two bends and proper inclines. The second flask is about half filled with a solution of acetate of lead, made acid by acetic acid. The outlet-pipe *c* of this flask is at its upper end bent downwards, and is connected by an india-rubber tube with another smaller glass pipe *d*, which passes through an india-rubber stopper *e*, and penetrates into the pipe B to its lowest point, terminating in a fine end, so as to prevent the gas coming out otherwise than by a very narrow passage, and in small bubbles. The pipe B is about one mètre long, and, as shown in the woodcut, is also filled with a solution of acetate of lead. While the left extremity of this pipe is closed by the stopper *e*, its right has a globe *f* at the end for the deposit of any fluid that may have been carried over; and in continuation therewith is a glass tube, through which the gas takes its course to the aspirator C. This aspirator, which in this instance has a capacity of 12 litres, is closed by means of an india-rubber stopper, through which passes the inlet-pipe *g*, bent at the top, the extreme end of which, going downwards, is connected with the glass tube near the globe *f* by an india-rubber tube. At the bottom of the aspirator a small lateral pipe is inserted, with an india-rubber tube, the latter being provided with a pressure-cock (*Quetschhahn*), together with a thumb-screw, for the purpose of discharging the water.

When the apparatus is used, the gas is admitted by a connecting pipe between the hydraulic main and the condenser—nearest, however, to the former.

The cast-iron pipe is drilled at the upper part, and the ¾-inch outlet lead pipe is carried upwards—say about 2 feet perpendicularly—to convey back into the cast-iron pipe a portion of the tar carried onward by the warm gas, but which soon becomes condensed. The lead pipe is then bent downwards, and carried about 10 feet in length to the experimental table, where it terminates with a stop-cock (*Schlanchhahn*). A short india-rubber tube is drawn over this cock, so as to allow of its being connected afterwards with the apparatus. Before an experiment takes place gas is allowed to flow freely for at least half an hour through the supply-pipe, in order that the inner surfaces of the same may become completely covered with tar, thus ensuring that the lead of the pipe does not decompose the sulphuretted hydrogen of the gas.

After filling both the flasks and the pipe in the manner before



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described with the absorbing fluids, and completely filling the aspirator with water, and making tight all the connexions of the apparatus, the water is allowed, by opening the pressure-cock *h*, to flow out of the aspirator until atmospheric air in the form of bubbles is sucked up by the apparatus, and until the level of the water corresponds exactly with one of the marked lines of the aspirator. The cock *h* is then again shut for a short time, and the loose end of the india-rubber tube fastened to the supply-pipe is then drawn over the glass pipe *a*. It is of course premised that the pressure of the gas in the supply-pipe is = O, as is the case in establishments were exhausters are used. Upon the connexion being restored between the apparatus and the supply-pipe, the pressure-cock is again slightly opened, and the gas allowed to pass gently—say about 20 litres per hour—until the water level in the aspirator has descended to the line marked 1. The flow of the gas is kept up as uniformly as possible by the regulating-screw of the pressure-cock. As we allow at our experiments from 40 to 50 litres to pass each time, it is necessary that the above experiment should be repeated several times. The pressure-cock and the cock of the supply-pipe being again shut, the stopper of the aspirator is loosened, the aspirator again filled with water, and the entire operation repeated in the manner above described.

Where no exhausters exist, and where there is a pressure of several inches in the (gas) supply-pipe, no aspirators are required, but a gas-meter is used instead.

In the first flask, E, filled with acetic acid, is collected the greater portion of the tar; no absorption of sulphuretted hydrogen takes place here, as the crude gas enters it at a high temperature. In the second flask, A, and also very slightly in the pipe B, a black precipitate is formed, composed partly of sulphuret of lead, partly of tar. The latter, however, is apt to carry down with it a considerable quantity of the solution of lead employed. In order to bring the precipitate thus formed into a ponderable condition, it is first filtered, then well washed, and dried at a temperature of about 100° C., and put into a small porcelain dish. Fuming nitric acid is then repeatedly poured over it, also at a temperature of about 100° C., and this is continued until the black mass has become quite white. When this has taken place, the residue of the nitric acid is driven off by evaporation at 100°. By the above operation the sulphuret of lead is converted into sulphate of lead, the tar is destroyed, and the lead carried down by the tar is changed into nitrate of lead. It is known that sulphate of lead is insoluble in water; nitrate of lead, on the contrary, is readily soluble. For this reason the white mass is washed with water in a porcelain dish, and separated by filtration from the insoluble sulphate of lead. The latter, after being properly washed and dried is heated in a crucible and weighed as $PbOSO_3$, from which the sulphuretted hydrogen is estimated according the formula:—

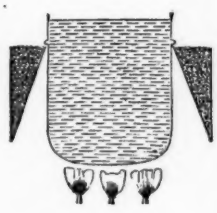
$$PbOSO_3 : HS = 151{\cdot}5 : 17.$$

DR. SCHILLING.

Correspondence.

HEATING BATHS BY GAS.

SIR,—In answer to your correspondent "Bos Piger," in the last number of the JOURNAL—"How can I heat my cistern with gas without an unpleasant smell?"—I submit the following as one likely to suit.



The annexed diagram is a sectional representation of a cistern of similar dimensions to the one he now uses, surrounded by a double zone or jacket; the inner one, being conical, forms a hot flue round the cistern; the outer one is cylindrical, riveted to the other at bottom, and the space between filled with ashes or other non-conducting substance.

It is to be heated by five or six jets of gas. Those represented in the sketch are ordinary union-jets, and these, though not the very best, require the least management of any: the only care required is to see that the flames are perfectly clear of each other, and that there is a space of half an inch between the top of the flames and the bottom of the cistern. If they touch the bottom, a deposit of soot will take place immediately.

A superior jet for heating purposes is the smokeless Bunsen burner, the flame of which should impinge to some extent on the bottom of the cistern, care being taken to prevent the gas igniting at the bottom of the tube. This will happen when the supply of air is too great in proportion to that of the gas, when the match is applied too soon in lighting, or in turning down the gas when the heat is too strong. In this latter case it will be better to extinguish as many jets as may be necessary, and allow the others to burn full.

When the gas ignites at the bottom of the tube, it should be turned off, and immediately turned on again and relighted.

I cannot at present give a more definite idea of the heating power of this apparatus than this: that, in one of the workshops here, with a cast-iron kettle in place of the water-cistern, we can fuse 70 lbs. of soft solder in 45 minutes, using five very small Bunsens, each passing about a foot of gas in that time.

It may be necessary to observe that, if the jacket be carried too low down, the gas will not be thoroughly burned. It is absolutely necessary that the products of combustion have ample room to escape, and that at a point *above* the flames.

If "Bos Piger" desires to remove these products from the house, it might be accomplished by inserting one end of a pipe near the bottom of the jacket, and the other into an adjacent chimney of good draught. I am led to suspect that the aperture in the roof, which he uses at present, only serves as a feeder for some powerful chimney in another part of the house, and that the air passes down the pipe instead of upward as required.

Grange Meter-Works, Edinburgh. MAGNUS MANSON.

Register of New Patents.

1600.—JAMES NICHOLAS, of Aspull, near Wigan, in the co. of Lancaster, oil refiner, for "*Improvements in retorts, and in the mode of working the same to obtain crude paraffin and other oils from cannel coal, bituminous matter, wood, peat, bones, or other material.*" Provisional protection only obtained. Dated June 12, 1866.

This apparatus consists of a peculiarly constructed retort, so arranged that a large superficial area of almost any size can be submitted to the direct action of heat, and is of the following description:—The bottom of the retort is a plane surface, by preference an iron plate, the sides and back being provided with two flanges, standing upwards at right angles with the plate, the said flanges being about 3 inches apart, the front of the plate having but one flange, which is moveable up and down by means of hinges. The top of the retort has a similar plate, a few inches shorter, its sides and back being provided with one flange, and it is so arranged that these flanges will drop down between the flanges of the bottom plate. This front is provided with a moveable flange on hinges, moveable up and down. The bottom and upper portion of the retort when placed on one another, the front flange on the lower portion being up, and the front flange on the lower portion being down, thus form a sort of box or retort. At the back, and by preference on the upper portion of the retort, are holes or pipes, by which the products of distillation pass to ordinary condensers.

On the top of the upper portion of the retort is an open furnace with a lid arranged on the principle of a hydraulic joint, and this hole is for the purpose of charging the retort. In the interior of the retort are rings similar to those used in rectangular coking ovens to draw out the charges when exhausted. In the front or moveable flanges of the upper and lower portions of the retort are holes opposite each other, for the purpose of inserting a poker for stirring up the charge in the course of distillation, and these holes have covers to close the holes when the stirring is not going on. A joint or opening between the flanges of the lower and the flanges of the upper portion of the retort along the sides and back is filled with lead, which, when the retort is heated, melts and forms a joint similar to a hydraulic joint, with molten lead in lieu of water. This lead is covered with sand or other material to prevent rapid oxidation. The moveable flanges in the front of the retort are luted with lime in the ordinary way, and the space between these two flanges is filled up with sand.

This retort is laid on a platform made of bricks and tiles, heated with one or more furnaces, connected with flues winding in a sinuous course beneath, and so arranged that the heat communicated to the retort shall be as uniform on the bottom as possible. The said flues communicate to a chimney or shaft direct, or, if desirable, pass over the top of the retort, in which case the top of the retort may be protected by brickwork from too great action of the heat. The platform or bed is made higher at the front than at the back to cause the oil as formed to run to the back, where the holes or pipes connected with the condenser are situated.

On the top of the retort is a pipe connected to a cistern of water, and connected with another pipe perforated with small holes in the interior, and at the front of the retort and extending its full breadth. Prior to the retort being drawn or discharged, a small quantity of water is allowed to run down the pipe, which, being dispersed into the retort by the perforated pipe over a large surface of heated material, gets converted into steam, which, as it rushes through the retort, forces what volatile matter remains in the charge out into the condensers.

Where the retort is made of a large size, it is advisable to have supports in it, these supports being connected with one portion of the retort only (either the upper or the lower), in order not to interfere with the difference of contraction and expansion that will be experienced, and by the upper and lower portions of the retort being at different temperatures. When it is desirable to take these retorts to pieces, it will be necessary to run off the lead in a molten state out of the joint between the flanges, and this is done by a tap placed at the bottom of the retort, at the back or lowest side.

1607.—JAMES ALEXANDER FORREST, of Liverpool, in the co. of Lancaster, stained glass manufacturer, for "*Improvements in the construction of lanterns.*" Patent dated June 13, 1866.

Lanterns constructed according to this invention are suitable for protecting gas, oil, and other lights employed for purposes of illumination. They are particularly well adapted for use on lamp-posts in streets and other public thoroughfares, for the following among other reasons—first, the transparent parts are not affected by weather or change of temperature; second, a very small surface of an opaque substance or body intervenes to prevent radiation of the light rays; third, they can be made of graceful outlines, and ornamented at

small cost; fourth, they can be easily and cheaply repaired; and, fifth, they can be fitted to lamp-posts now in use.

The invention consists in the employment in the construction of a lantern of one piece of smooth or fluted blown sheet-glass in combination with a suitable frame of metal or other rigid material. In the manufacture of sheet-glass, the ordinary practice is to form cylinders by blowing, and afterwards to cut these up, flatten, and anneal them. By this invention the cost of cutting and flattening is saved, the glass as it leaves the hands of the blower (of course after it has been annealed and trimmed) being employed. Other forms than the cylindrical can be readily blown and used in the construction of lanterns.

1615.—George Dunbar Malam, of Halifax, in the co. of York, gas engineer to the Halifax Corporation, for "*The purifying of ammoniacal liquor by an improved process, and the application of such purified ammoniacal liquor to the purifying of coal gas.*" Provisional protection only obtained. Dated June 14, 1866.

In purifying ammoniacal liquor and employing such liquor to the purifying of coal gas according to this invention, a "desulphurating scrubber" is employed, which is open at the top and partly filled with coke (or other substance for increasing the circulation of air, for the purpose hereinafter described). A stream or shower of ammoniacal liquor is caused to descend on the coke in the said desulphurating scrubber, through a "rose" or a perforated pipe or pipes. To the interior, and near the bottom of the desulphurating scrubber, a current of atmospheric air is injected or forced by means of a fan and suitable piping. The commingling of the atmospheric air with the descending ammoniacal liquor effectually desulphurates such liquor.

The ammoniacal liquor so purified is then pumped into ordinary gas-scrubbers, and the coal gas to be purified is forced or drawn by an exhauster through the purified ammoniacal liquor contained in the scrubber or scrubbers. Sulphuretted hydrogen and sulphur compounds are removed by this operation from coal gas. It will be seen that, by the process above described, ammoniacal liquor may be desulphurated, and such liquor employed to the purifying of coal gas, the operations being performed with readiness and economy.

1628.—Benjamin Franklin Stevens, of 17, Henrietta Street, Covent Garden, in the co. of Middlesex, gentleman, for "*A new or improved method of treating permanent inflammable gases, whereby greater heat is obtained therefrom.*" A communication. Patent dated June 15, 1866.

This invention has for its object the obtaining of a greater degree of heat from the burning of coal gas or other permanent inflammable gas produced by the distillation of wood, resin, petroleum, or other hydrocarbon substances or equivalents, whereby they are rendered more suitable as fuel for manufacturing and domestic purposes and for the generation of steam. It consists essentially in mixing steam with gas obtained from the distillation of wood, resin, petroleum, peat, and other hydrocarbon substances, in the manner hereinafter described, and employing this mixture for the production of heat. In carrying out this invention, the ordinary arrangement of furnaces provided with tubes, burners, and other appliances heretofore employed for burning gas, may be used, but with the addition of pipes for the purpose of mixing the steam with the gas just previous to its reaching the burner or burners. By thus mixing steam with the gas-jet just before it is burned, the character of the flame is changed and its volume greatly increased, so that, when applied, for example, to the heating steam-generators, it will entirely fill the spaces under the boiler and between the tubes.

In lieu of passing the steam-jet directly into the gas pipe or pipes as they approach the burner, the steam-jet may be arranged so as to cause an increased draught of air to act upon the flame, and the mixture of gas and steam may be used either alone as gas is commonly used, or it may be used to aid in the combustion of ordinary solid fuel. The steam for admixture with the gas may be generated in a boiler heated either by the flame produced by the burning of such mixture itself or by a separate fire. In some cases—such, for example, as the heating of buildings, heating of metals, roasting ores, and the like—the steam-generator for supplying the steam for admixture with the gas may form part of the fire-box or furnace in which such mixture is to be burned.

By heating either lime or potash sponge or wire, to an intense white heat, by means of the hereinbefore described mixture of steam and gas, a light suitable for illuminating purposes may be obtained.

1636.—George Henri Marc Muntz, of Birmingham, in the co. of Warwick, manufacturer, for "*Improvements in the manufacture of certain fittings for gas, steam, and water tubes.*" Patent dated June 16, 1866.

This invention consists in certain improvements in the manufacture of the joints or connexions for wrought-iron tubes for the conveyance of gas, steam, and water, such, for instance, as ties, crosses, or joints, having any number of ways. In carrying out this invention, a plate of wrought-iron, with a hole punched through the centre, is used. A bar is then taken, rolled to a proper section, and bevelled on one edge, and this is formed into a short socket and scarf weld in the usual way. This socket is inserted into the plate, and almost through the centre hole, the bevelled edge of the socket being by preference on the inside. Both socket and plate are then placed in a suitably formed concave bottom die, and a top die is employed, convex in form, and provided with a tapered plug, by which the bevelled edges of the socket are bent down and welded, while the plate is at the same time bevelled on its meeting edges, and dished or turned up into a form of section, which will, when the edges are subsequently brought together and welded, form a complete circle, with the edges scarfed and lap-welded. This constitutes a three-way or T-joint. A four-way or cross-joint is made in precisely the same way as that last described, but the plate will be shorter, to form one-half the barrel of the T-joint only. Two of these parts being brought together and welded, they form the cross or four-way joint. Or by another mode, two holes are punched in a longer plate, and two sockets are inserted in them. The plate is then bent round in the direction of its length, and the meeting edges being welded, the four-way joint is formed.

In making joints with more than four ways a similar mode is adopted, but longer plates are employed to receive a greater number of sockets, so that when the plate is bent round each socket forms a radiating arm from the common centre formed by the plate. This description of joint may also be formed by using more than one plate if preferred, as it may be convenient to use two or more, each containing its required number of sockets, to form when combined the number of joints required. It is also proposed to form these joints by raising the sockets out of the solid plate of metal by means of dies and punches under force or pressure, so as to avoid welding the sockets into the plates.

1651.—Adolphe Miroude, of 18, Rue Lemire, Rouen, in the empire of France, for "*A new application of the electric light for lighting buoys of every description.*" Patent dated June 20, 1866.

This invention consists in the employment of the electric light for lighting buoys without requiring any communication from the shore, by which they can be increased in number, and placed as far from the land as the sea or river navigation requires, the object being to light buoys by means of the light produced by electricity in the apparatus known as "Geissler's tube," and it is carried out in the following manner:—In the buoy to be lighted there is placed—whatever may be its dimensions and form, but arranged so as to keep in equilibrium—a receiver or battery, of a size and weight in proportion to the size of the buoy, producing an electric current; then a Ruhmkorff induction bobbin; and, lastly, at its upper part a lamp is placed, furnished or not with lenticular glasses, or glasses of any other form, in which lamp are set several glass tubes or spheres known as "Geissler's tubes." A plate or roofing of metal, or other suitable material, may be placed above as a shelter for the apparatus.

1666.—James Parker, of 6, Lilford Road, Camberwell, in the co. of Surrey, gentleman, for "*Improvements in motive-power apparatus, applicable for propelling vessels, for raising water, and for other purposes.*" Patent dated June 22, 1866.

The first part of this invention consists in the direct application of steam and compressed air, injected into tanks or holders containing water, and acting directly, without the employment of a piston, upon the surface of the water, for the purpose of discharging, forcing, or injecting, by the pressure of the injected steam and air, the water from such tanks through suitable outlets, according to the object to be attained. For injecting the steam and air, steam-jets and air-nozzles are preferred, similar to those referred to in the specifications of letters patent granted to the present patentee, dated Feb. 28, 1862, No. 552, and Oct. 25, 1863, No. 2620, but other suitable steam and air injecting apparatus may be employed. The second part of the invention consists in applying the steam and air pressure, in the manner above described, to the propulsion of vessels.

1696.—Alfred Clayton, of Kingston, in the co. of Surrey, for "*An improved apparatus for registering the flow of water or other liquids or fluids through pipes or orifices.*" Provisional protection only obtained. Dated June 26, 1866.

This invention consists in having a tube of india-rubber, or of any other flexible material not liable to injury from water, or such other liquid or fluid as may be passed through it, which said tube is pressed against by the arms of a small wheel, so as nearly or entirely to close it. Circumstances will determine the number of such arms, but four, six, or eight will generally be found sufficient. The extremities of the arms may be furnished with small rollers, to aid their passage over the flexible tubes. The water being admitted at the inlet end of the flexible tube it presses against the extremity of the arm, and so urges it forward till the next arm takes its place, which is pushed forward in like manner, and the small wheel is thus kept constantly revolving. By suitably connecting it with a counter the quantity of water or other liquid or fluid may be registered.

1697.—James Young the younger, of Limefield, in the co. of Mid Lothian, N.B., gentleman, for "*Improvements in apparatus for the treatment of hydrocarbon oils.*" Provisional protection only obtained. Dated June 26, 1866.

This invention relates to an apparatus to be used in the treatment of certain hydrocarbon oils, such as those obtained from the distillation of coal or shale at a low temperature, and known as paraffin oils, or such as petroleum, either crude or more or less refined; the object in view being the reduction of the specific gravity of such oils and the improvement of their properties for illuminating purposes. The apparatus, which it is proposed to employ in the treatment of such oils, consists of a closed boiler or distilling vessel of sufficient strength to resist a pressure of at least 100 lbs. to the square inch. This vessel having been charged with oil, heat is applied thereto, and the vapour of the oil, produced by such application of heat, is allowed to pass to the condenser at any regulated pressure through a pipe provided with a valve loaded to the pressure required; or a separate tube with regulating stop-cock may be provided, for allowing the vapour to pass to the condensing apparatus. The boiler or distilling vessel is further provided with a pressure gauge, for the purpose of indicating the pressure; provision is also made in the construction of the distilling vessel, for cleaning out or removing from it at intervals the heavy deposits, which, if allowed to remain, would seriously interfere with the process of distillation, and it is evident that the more capable it is of being cleaned out the better.

1698.—Charles Forster Cotterill, of Cannock, in the co. of Stafford, gentleman, for "*Improvements in the manufacture of earthenware and other pipes, and in machinery or apparatus to be employed in the said manufacture.*" Provisional protection only obtained. Dated June 26, 1866.

This invention relates to such pipes as are made double and in segments—that is, pipes which consist of two concentric pipes, one within the other, made by being built up of segmental pieces. The said pipes are usually made of earthenware, and are principally used for conveying water and sewage. The improvements in the manufacture of the said pipes consist in making the segmental pieces much thinner than usual, and filling up the space between the inner and outer pipes with cement, so as to consolidate the whole into one compact mass, instead of leaving the space between the two pipes empty.

1710.—William Robert Lake, of No. 8, Southampton Buildings, Chancery Lane, in the co. of Middlesex, consulting engineer, for "*Improvements in the mode of distilling or separating volatile products from oils and other fluids.*" A communication. Provisional protection only obtained. Dated June 27, 1866.

This invention relates to the process of removing products which are volatilizable, at any given temperature, from the substances with which they may be combined. This process consists in forcing or drawing through such substances a continuous stream of air, which by preference is heated to the required temperature.

1777.—Michael Henry, of 68, Fleet Street, in the City of London, patent agent, for "*Improvements in governors.*" A communication. Patent dated July 4, 1866.

In the specification of letters patent granted to the present patentee on the 21st of December, 1864, No. 3169, various arrangements of centrifugal action governors are described, all having for their object to render the speed of rotation independent of the distance between the weights, and the term "isochronism" was applied to the property or characteristic common to those various arrangements. In seeking to apply the new principle of construction to steam-engine governors, it was found that the arrangement had a tendency to depart from a regular or uniform motion, and to acquire a velocity sometimes greater and sometimes less than the mean velocity. In endeavouring to obviate this objection, it has been at length ascertained that the real method consists in connecting motion to the weights of the governor by the intervention of appliances capable of being acted upon by the variation which precedes, and effects change of velocity. This new principle of construction consists, first, in rendering the governor-weights independent of the axis which carries them, and as free thereon as possible; and secondly, in communicating motion to them by means of a bush, ferrule, or tube, having a helicoidal or spiral screw-thread thereon, and fitted on a portion of the axis, which is screw-threaded in like manner, so that the two take into each other like a nut and screw. The direction of the spiral curvature is so arranged with respect to the direction of rotation of the governor, that by the increase of speed the reaction exerted on the bush in the direction of the axis will tend to throw out or separate the weights, and decrease of speed will produce a contrary effect.

1787.—William Chesney, of Willenhall, in the co. of Stafford, for "*Improvements in the manufacture of water and steam cocks or stop-valves; applicable also for other like purposes.*" Patent dated July 6, 1866.

The object of this invention is to construct a durable and efficient valve-cock or stop-valve for stopping or regulating the flow of water, steam, gas, or other fluids and liquids. For water-works purposes it is proposed to bring the pressure to the back of the valve. This will prevent waste should the screw become worn, and by this means the pressure will keep the valve closed, while the wear will be very much reduced, as less strain will be required to close the valve, and concussion will also be prevented. The cock is so constructed that its body or chamber has nothing to do with the fit of the valve, the said body or chamber being a receptacle for the working parts. These working parts are fitted together separate from the body or chamber, and are screwed therein by means of joints, or washers and screws, or screws and nuts. By this mode of construction no disarrangement is caused between the valve and the face by fixing it in its place, and the valve and seat are both in the part inserted. Suitable means are also provided to keep the valve from turning while being opened and shut. By this arrangement, too, the valve and seat, or washer, always come together in the same manner, so that no undue wear is caused to the valve-face.

1788.—Enoch Harrison Aydon, of Wandsworth, in the co. of Surrey, civil engineer, and Edward Field, of Chandos Chambers, Adelphi, in the city of Westminster, consulting engineer, for "*Improvements in drawing or exhausting and forcing fluids, and in instruments or apparatus applicable to such purposes.*" Patent dated July 6, 1866.

This invention has for its object improvements in drawing or exhausting and forcing fluids, and in instruments or apparatus applicable to such purposes, and consists, amongst other things, in the use of steam-induced currents for the purpose of drawing or inducing a regular flow of water amidst or amongst and past the outer surfaces of the pipes or passages of surface condensers, and in the use of like steam-induced currents for the purposes of drawing and forcing water in steam fire-engines for the extinction of fires without the employment of pumps.

1820.—Charles Edward Austin, of 7, Broad Sanctuary, Westminster, in the co. of Middlesex, civil engineer, for "*Improvements in apparatus applicable to sewers and drains, for separating the fluid and solid parts of sewage.*" Patent dated July 11, 1866.

This invention consists in the employment of apparatus and portable valve-boxes or tanks, constructed and applied as hereafter explained, for the following objects:—To separate by filtration at the earliest convenient moment the fluid from the solid parts of sewage or refuse polluted water in drains or sewers; to render the fluid part sufficiently innocuous to admit of its being allowed to flow into the nearest appropriate water-way; and, lastly, to remove the solid parts conveniently, expeditiously, and without nuisance. To effect these objects, a shaft or chamber is constructed at each point of drainage, to which the drains or sewers leading from neighbouring parts or places are directed, and the sewage or refuse water is made to flow into this chamber. A box or tank is fitted into this chamber in such a manner as to receive all the sewage or polluted water from the sewers or drains. This box or tank is enclosed in a filter fitted with deodorizing and filtering materials in such a manner as to allow the fluid portion of the sewage to flow through the said filter into the chamber, but to detain the solid parts, and cause them to be deposited in the box or tank, or kept in the filter. The filter containing the box or tank can be withdrawn, and placed in a carriage made for the purpose without greatly disturbing its contents. When great purity is required, a second or subsidiary moveable filter is used, which is sometimes made to surround the first filter, and sometimes to occupy a second chamber in connexion with the first, in such a manner that the fluid in passing from the first filter must flow through the second before it can escape to its outlet.

1827.—William Glassford Walker and Robert Frazer Smith, both of Kilmarnock, in the co. of Ayr, N.B., for "*A certain improved method of producing illuminating gas.*" Patent dated July 12, 1866.

This invention, which has for its object the production of gas specially designed for illuminating purposes, is as follows:—The apparatus is that ordinarily employed at gas-works for producing gas from coal in the usual way, but in lieu of using coal as the origin from which the gas is evolved, a quantity of peat or other suitable porous material capable of itself of generating gas on the application of heat is saturated with shale oil or petroleum, or other mineral hydrocarbon; the material so saturated is placed in the ordinary retort, and heat is applied, when the oil and the naturally combined hydrocarbons of the porous material are driven off in the form of an incondensable illuminating gas. The production of gas from mineral oils is not new, but when formed it is found speedily to condense. This invention specially relates to the production of illuminating gas from the kind of material hereinafter described, impregnated before being placed in the retort with a mineral hydrocarbon. The gas so produced is less combined with sulphur than common coal gas, consequently requiring a much less quantity of lime for purification. Another very great advantage resulting from the production of gas in the manner now described is the saving of time over and above what would be required for the production of coal gas.

By peat is signified that substance or combination of substances generally known by such appellation in ordinary phraseology, it being compounded of various vegetable materials—usually, mosses and certain species of aquatic plants, in different, conditions of decomposition. Occurring in the natural state peat contains about 75 parts of water, and after being dried in the open air in the usual way its composition averages 30 per cent. of water, 42 per cent. of volatile matter, and 28 per cent. of coke. In this air-dried state the peat may be adapted for the purpose of forming part in the carrying out of this invention, although to produce better results it is preferred that it should be more perfectly dried or desiccated, in order that it may be capable of absorbing a maximum quantity of oil.

The oil which it is preferred to employ is that which is commercially known as shale oil, it being obtained from the destructive distillation of certain of the shales and coals at a low temperature; or that which is known as petroleum may be employed in lieu of the preceding oil. In place, however, of any of the oils hereinbefore mentioned, part of this invention consists in using oil distilled from peat itself, either separately distilled or as forming part of the process of illuminating gas production under the present invention.

Although under this invention is included the use of the foregoing oils in their crude condition, that is, previous to subjection to any process of distillation, still it is to be understood that it is preferred to utilize that portion remaining over after the spirit and portion known as burning oil, have been separated.

In the experiments carried out for the purpose of perfecting this invention, it was found that ordinary air-dried peat, containing 30 per cent. of water or thereabouts, is capable of absorbing about 50 per cent. of its weight of the oil referred to. In order, however, to provide for increased absorption, it is preferred that the oil should be heated to a temperature of about 120° Fahr. After the absorption has taken place, the oil-charged peat is allowed to drain and cool, after which it may be handled, and packed away in stacks like coal. It is usually piled without any appreciable loss of the oily matter. This oil-charged peat may be used alone in the retorts for producing illuminating gas, or it may be mixed with peat which has not been soaked in the oil. From the average of many experiments, it is found that a mixture of 1 ton or 240 gallons of shale oil and 2 tons of peat produces 61,000 cubic feet of gas, or an average of about 20,000 feet per ton of mixture; but the patentees do not limit themselves to the foregoing proportions of admixture.

The gas produced is of high illuminating power, and contains from 11 to 17 per cent. of hydrocarbons, absorbable by fuming sulphuric acid. After production the gas does not tend to condense into oil again, and, after attaining the mean temperature and pressure, it may be kept as long as ordinary coal gas.

A great advantage which this invention possesses consists in the fact that no change is required in the plant at present employed in the existing gas-works to enable it to be carried out, as the mixture is charged into the retorts in the ordinary manner. If, however, it happens that the oil used contains a considerable proportion of spirituous and highly volatile ingredients, it is preferred to employ a charging-scoop, shaped similar to the aperture of the retort. The oil-charged peat is introduced into this scoop, and the scoop is then pushed into the retort. The scoop being fitted with a piston, this is pushed forward by means of a handle attached to it, and the oil-charged peat is deposited on the upper part of the retort. After it is fed, the scoop is instantly withdrawn, and the retort-door closed up

and luted before any flame can escape from the retort-mouth. The use of the scoop now referred to forms no part of the invention; and, provided heavy oils are used, which being less volatile than the lighter ones, any departure from the ordinary mode of charging is unnecessary.

With reference to the temperature to be employed for converting the materials into gas, it is recommended that what is ordinarily known as a white heat should be employed, the experiments at this temperature having yielded satisfactory results, both as regards the quality and the quantity of gas. The water present in the peat has an important bearing in the reaction taking place at the exalted temperature it is preferred to employ, for without the water held in the peat, or that which is produced from the elements oxygen and hydrogen combined in its woody fibre, no permanent gas can be produced.

Another advantage from the adoption of this invention is the saving of time effected, as the whole of the gas passes over in about 1½ hour in place of 4 hours, as when coal is used as the gas-producing material. For the reason that no sulphur compounds are present in the gas made under this invention, less expense is incurred in purifying it, the amount of lime required averaging very little more than a fourth of that used for purifying ordinary coal gas. From the complete absence of bisulphide of carbon no sulphuric acid is produced in the combustion, as is ordinarily the case with coal gas.

The secondary products are of high value, and on that account the absolute cost of the gas itself is diminished, there being always a ready market for the products. From the liquor condensed in the mains there may be extracted sulphate of ammonia, acetic acid, and methylic alcohol, or wood spirits. From the tar there may be extracted burning oil, pitch, and paraffin, or this tar may be used for admixture with the peat to be used for producing the gas; whilst the carbonaceous residuum or coke left in the retorts is valuable for sanitary purposes and sugar refining, acting respectively as a deodorizer and disinfectant, or as a substitute for the animal charcoal at present employed.

1829.—WILLIAM READE, of 4, Clayton Square, Liverpool, in the co. of Lancaster, gentleman, for "*Improvements in steam-pumps.*" A communication. Application dated July 12, 1866. Provisional protection has not been allowed for this invention.

This invention relates to improvements in the construction of steam-pumps, called steam syphon-pumps, for which letters patent were granted to William Edward Newton, dated Jan. 23, 1864, No. 198.

The object of the said improvements is to effect, by the employment of the same volume of steam at like pressure, the raising of a larger quantity of water than could be raised by pumps constructed in accordance with the specification of the invention patented as above mentioned, and this—that is, the raising of a large quantity of water—is effected by employing for each pump two or more supply-pipes instead of one, connected with or opening into the steam chamber or vessel, such steam chamber or vessel and the steam and delivery pipes being constructed as described in the specification above mentioned. Or an approximate result is obtained by making from one supply-pipe two or more openings or connexions into the steam chamber or vessel.

1854.—ALEXANDER ROGER STARK, engineer, and JAMES WOODMAN, commercial agent, both of Woolwich, in the co. of Kent, for "*Improvements in the means of fixing the covers of gas-retorts.*" Provisional protection only obtained. Dated July 16, 1866.

In fastening the covers of gas-retorts, it is usual to employ a cross-bar, the ends of which are inserted in lugs projecting from the retort, and with a screw and hand-lever in the middle, which screw presses on the centre of the retort-cover. This fastening is somewhat troublesome to apply and undo, and the pressure of the screw being in the centre of the cover, it is liable to spring off at the circumference; besides which the men are necessitated to be in near proximity to the retort for a considerable length of time, when applying and removing the cover, and therefore subjected to great heat.

According to this invention, a cross-bar is used, which is simply dropped into two hook-like lugs or projections in the same position as those above mentioned, but in which this cross-bar rotates as in bearings. Near the ends of the cross-bar two cams are applied, which take a bearing on the retort-cover, when the cross-bar is rotated, and press the said cover hard up to the retort, the pressure taking effect near the circumference of the cover. A hole or holes is or are formed at mid-length of the cross-bar, into which a rod of some length is inserted, which is used as a lever to rotate the cross-bar; it at the same time serves to keep the workman at a distance from the retort, as he can lift the cross-bar by the said long rod, and reach it into its bearings, into which it is simply dropped, as before mentioned, and rotated by the leverage of the long arm or rod a sufficient portion of a revolution to cause the cams to take effect. The reverse operation serves to remove the pressure from the cover, which is then free to be removed. The cams are rapid in their action, that is to say, do not require much extent of a revolution (say one fifth or sixth) to bring them to bear. When hard up, however, they arrive at a slow part, which prevents their retrogade movement.

1866.—WILLIAM EDWARD GEDGE, of the firm of John Gedge and Son, of 11, Wellington Street, Strand, in the co. of Middlesex, patent agent, for "*An improved gas-burner.*" A communication. Provisional protection only obtained. Dated July 17, 1866.

This invention consists in a novel construction of gas-burners, by which the illuminating power of the gas is greatly increased, and its consumption more economically regulated than by ordinary burners. The gas is conducted by an ordinary burner to a closed tube or chamber of a larger size, from which it passes through a second burner of superior capacity, placed above the said chamber. The size of the apertures of these two burners will be regulated by the quality of the gas, but the lower or inlet apertures should always be smaller than the upper or burning aperture. To diminish the length of the flame, which is extraordinary, and in some cases inconvenient, the gas is conducted through a layer of asbestos, cotton, filings, or other suitable materials, which will check the pressure of the gas. Under this arrangement the supply of gas is not greater than required for complete combustion, and the gas is mixed with neither more nor less air than is necessary to produce the greatest illuminating power.

1888.—MARC ANTOINE FRANÇOIS MENNONS, of the firm of Mennons and Telescheff, home and foreign patent agents, of 8, Southampton Buildings, in the co. of Middlesex, and 27, Rue Laffitte, Paris, in the empire of France, for "*Improvements in the mode of and apparatus for generating gas for lighting, heating, and other purposes.*" A communication. Patent dated July 20, 1866.

This invention relates to improvements in the manufacture of combustible gas from volatile hydrocarbons in general, and more especially from those of the petroleum class. These hydrocarbons when of low density are, as is well known, converted into gas at a very low temperature, and as their vapours contain in abundance two of the constitutive elements of flame—hydrogen and carbon—their application to lighting purposes may be obtained by the simple admixture of oxygen, which, on the one hand, reduces the hydrogen to water, and on the other transforms the carbon into carbonic acid. The production of thoroughly combustible gas is, therefore, dependent on the due apportionment of the three elements of flame, and this is obtained by the combination of apparatus described, one part of which supplies the hydrocarbon vapours, while the other supplies the requisite proportion of atmospheric air.

In this combination the evaporating surfaces are composed of cotton-wicks, or other capillary materials, capable of distributing liquid hydrocarbons in layers or pellicles of extreme tenacity, while the atmospheric air is supplied by a separate generator, which may consist of any ordinary ventilator or blowing apparatus, provided with suitable regulating mechanism. The generator is a simple hot-air apparatus, operated by the tension of the dilated air, as in the Ericson engine, of which it is in fact a modified form, involving no other novelty than the utilization of its escaped air to the purposes of the invention.

1955.—CHARLES DENTON ABEL, of 20, Southampton Buildings, Chancery Lane, in the co. of Middlesex, patent agent, for "*Improvements in apparatus for regulating the supply of water and other fluids to steam-boilers and other receptacles.*" A communication. Patent dated July 28, 1866.

The importance of the proper regulation of water to steam-boilers is well known, as well as the maintenance of a constant water level therein. The object of the present invention is the manufacture of apparatus for such regulation, combining perfect accuracy of action with simplicity and economy of construction, but the arrangements and operation of such apparatus cannot be well understood without the aid of the drawings attached to the specification.

APPLICATIONS FOR LETTERS PATENT.

274.—THOMAS COOKE, sen., and CHARLES FREDERICK COOKE, of the firm of Messrs. T. Cooke and Sons, Buckingham Works, in the city of York, engineers, for "*An improved method of raising water by atmospheric pressure, and apparatus connected therewith.*" Feb. 1, 1867.

284.—JACOB BUHRER, of Munich, in the kingdom of Bavaria, but now residing at 13, Keppel Street, in the co. of Middlesex, and ASTLEY PASTON PRICE, of 47, Lincoln's Inn Fields, in the co. aforesaid, consulting chemist, for "*Improvements in effecting the distillation of coal, shale, wood, peat, and other bituminous or carbonaceous substances.*" Feb. 1, 1867.

291.—AARON BRADSHAW, of Accrington, in the co. of Lancaster, engineer, for "*An improved cock or tap.*" Feb. 2, 1867.

343.—WILLIAM GEORGE BEATTIE, of South Bank, Surbiton, in the co. of Surrey, engineer, for "*Improvements in slide-valves.*" Feb. 7, 1867.

363.—DANIEL NATHAN DEFRIES, of Euston Road, in the co. of Middlesex, consulting gas engineer, for "*Improvements in gas-burners.*" Feb. 8, 1867.

383.—GEORGE HUGH KIDD, of Merrion Square, in the city of Dublin, doctor of medicine, for "*Improvements in apparatus for regulating the supply of water to cisterns, and for preventing the bursting of water-pipes.*" Feb. 11, 1867.

GRANTS OF PROVISIONAL PROTECTION.

64.—LEWIS HAND, of 22, Coleman Street, in the City of London, attorney-at-law, for "*Improvements in treating benzole and other hydrocarbon liquids, and in making such liquids non-explosive, and of generating an illuminating gas therefrom.*" A communication. Jan. 10, 1867.

69.—EDWARD THOMAS HUGHES, of the firm of Hughes and Son, patent agents, 123, Chancery Lane, London, for "*A new or improved differential pump for pumping and discharging varying quantities of liquid and producing varying pressure.*" A communication. Jan. 11, 1867.

73.—FREDERICK JOHN EVANS, of the Chartered Gas-Works, in the city of Westminster, for "*Improvements in the manufacture of illuminating gas.*" Jan. 11, 1867.

119.—ERNST SÜVERN, of Halle, in the kingdom of Prussia, architect, for "*An improved mode of and apparatus for purifying the impure waters emanating from sugar factories and other industrial establishments, applicable also to the purification of sewage water.*" Jan. 17, 1867.

145.—ALFRED UPWARD, of the Chartered Gas Company, 146, Goswell Road, in the co. of Middlesex, civil engineer, for "*Improvements in apparatus used for boring and tapping gas and water mains, and in fitting service-pipes or cocks thereto.*" Jan. 19, 1867.

164.—JOHN PATISON, of Ardrie, in the co. of Lanark, N.B., manufacturing chemist, for "*Improvements in the production of illuminating gas, and in the manufacture and application or use of new or improved materials or fuels for the same, and in the means or apparatus employed therefor.*" Jan. 22, 1867.

211.—JOHN JAMES LUNDY, of Leith, in the co. of Mid Lothian, N.B., colour, grease, and chemical manufacturer, for "*Improvements in the*

treatment of the residual matters resulting from and obtained in the purification and distillation of mineral or hydrocarbon oils, and also in the treatment of coal tar and various waste or other alkaline and lime substances for the purpose of utilizing the same." Jan. 26, 1867.

231.—JAMES GREENSHIELDS, of Glasgow, in the co. of Lanark, N.B., for "*An improved compound or combination of materials to be used for the production of illuminating gas.*" Jan. 29, 1867.

NOTICES TO PROCEED.

2473.—JOHN JAMES LUNDY, of Leith, in the co. of Mid Lothian, N.B., colour, grease, and chemical manufacturer, for "*Improvements in the treatment of the residues resulting from and obtained in the purification and distillation of mineral oils, for the purpose of utilizing the same.*" Sept. 25, 1866.

2532.—JAMES CAVANAH, of 12, Rake Lane, Liverpool, for "*An improvement in water-closets, cisterns, and soil-traps.*" Oct. 3, 1866.

2537.—MATTHEW WEST, of Stevenage, in the co. of Hertford, tailor, for "*Improvements in fishtail gas-burners.*" Oct. 3, 1866.

2581.—ABRAHAM RIPLEY, of 34, West Square, Southwark, in the co. of Surrey, engineer, for "*Improvements in the construction of water-meters, which improvements are also applicable to the measuring of liquids generally.*" Oct. 8, 1866.

2733.—JAMES GREENSHIELDS, of Glasgow, in the co. of Lanark, N.B., crude oil distiller, for "*Improvements in making gas and coke.*" Oct. 23, 1866.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

280.—JOHN HAWKINS and CHARLES HAWKINS, "*Improvements in the manufacture of gas for illumination and other purposes, and in apparatus connected with the same.*" Feb. 2, 1864.

281.—GEORGE HAMMOND and JAMES WILLIAM KEMP, "*Improvements in the manufacture of illuminating gas, and in apparatus to be employed therein.*" Feb. 2, 1864.

307.—ROBERT OWEN, "*Improvements in apparatus for filtering water and other liquids.*" Feb. 5, 1864.

Parliamentary Intelligence.

HOUSE OF LORDS.

FRIDAY, FEB. 8, 1867.

The Lord Chancellor acquainted the House that the Standing Orders applicable to the following Bills have not been complied with:—The CRICKHOWELL GAS AND WATER; SHEFFIELD WATER (NEW WORKS); SOUTHPORT IMPROVEMENT (WATER); and WIDNES GAS, WATER, AND IMPROVEMENT.

MONDAY, FEB. 11.

The ABERTILLERY GAS AND WATER; BARKING GAS; CAMBORNE WATER; DARTFORD GAS; FISHERTON ANGER, AND BEMERTON WATER; GREAT GRIMSBY GAS; HUYTON AND ROBY GAS; PRESCOT GAS; REDHILL AND WARWICK TOWN WATER; RICHMOND GAS; RISCA AND PONTYMINSTER GAS; WANDSWORTH AND PUTNEY GAS; and WEST KENT GAS Bills were presented, and read a first time.

TUESDAY, FEB. 12.

The Lord Chancellor acquainted the House that the Standing Orders applicable to the following Bill have not been complied with:—The WEYMOUTH CONSUMERS GAS Bill.

The CHESTER PARAFFIN LIGHT COMPANY; LAMPETER, LLANDYSSIL, &c., GAS; MITCHAM AND WIMBLEDON GAS; and PAIGNTON WATER Bills were presented, and read a first time.

THURSDAY, FEB. 14.

Petitions were deposited against the PAIGNTON WATER Bill, from the landowners, &c., of Paignton.

FRIDAY FEB. 15.

The following Bills were read a second time:—ABERTILLERY GAS AND WATER; BARKING GAS; DARTFORD GAS; FISHERTON, ANGER, AND BEMERTON WATER; GREAT GRIMSBY GAS; PRESCOT GAS; REDHILL AND WARWICK TOWN WATER; RICHMOND GAS; RISCA AND PONTYMISTER GAS; WANDSWORTH AND PUTNEY GAS; and WEST KENT GAS Bills.

Petitions were deposited against the PRESCOT GAS Bill, from Thomas Melling.

HOUSE OF COMMONS.

FRIDAY, FEB. 8, 1867.

The DARTFORD WATER; BIRKENHEAD IMPROVEMENT COMMISSIONERS; DEWSBURY, BATLEY, AND HECKMONDWIKE WATER; IMPERIAL GAS; LEEDS CORPORATION WATER; GASLIGHT AND COKE COMPANY; MANCHESTER CORPORATION WATER; MIDLAND RAILWAY (DERBY GAS-WORKS); SHEFFIELD WATER CONSUMERS; SOUTHWARK AND VAUXHALL WATER; WALLASEY IMPROVEMENT; FARNWORTH PARK AND IMPROVEMENT; SOUTHPORT WATER; ST. HELEN'S WATER; STOCKPORT CORPORATION WATER; STRATFORD-UPON-AVON GAS; KEIGHLEY WATER, &c.; BINGLEY EXTENSION AND IMPROVEMENT; WOOLTON GAS; HEYWOOD IMPROVEMENT; NEWCASTLE-UPON-TYNE AND GATESHEAD GAS; ROCHESTER, CHATHAM, AND STROUD GAS; SHEFFIELD WATER (AMENDMENT); SOUTH SHIELDS GAS; STALYBRIDGE GAS; WINDSOR ROYAL GAS; BARNSLEY GAS; EAST LONDON WATER (THAMES SUPPLY); EAST LONDON WATER (VARIOUS POWERS); MOLD GAS AND WATER; KIRKCALDY AND DYSART WATER; OTLEY LOCAL BOARD; SCARBOROUGH GAS; ETON GAS; HAMPTON COURT UNITED GAS; SUTTON, SOUTHCOATES AND DRYPOOL GAS; HERNE BAY WATER; PETERBOROUGH WATER; BRIERLEY HILL, QUARRY BANK, &c., IMPROVEMENT; DUNDEE NEW GAS; KIDDERMINSTER GAS; SALFORD BOROUGH; ABERDEEN POLICE AND WATER; AYR WATER; DUNDEE GAS; WOLVERHAMPTON NEW WATER; and PLYMOUTH CORPORATION WATER, &c., Bills, were read a first time.

The Standing Orders applicable to the WIDNES GAS, WATER, AND IMPROVEMENT Bill were reported not to have been complied with; it was, therefore, referred to the Standing Orders Committee.

MONDAY, FEB. 11

The WEYMOUTH CONSUMERS GAS.—The petition for a Bill was referred to a Select Committee on Standing Orders.

The DUNDEE GAS AND DUNDEE NEW GAS COMPANIES; SLIGO BOROUGH IMPROVEMENT; WELLS (SOMERSET) GAS; and HARTLEPOOL GAS AND WATER Bills, were read a first time.

TUESDAY, FEB. 12.

The following Bill was read a first time:—TYNEMOUTH PARISH GAS Bill.

WEYMOUTH CONSUMERS GAS Bill.—Reported in respect of non-compliance with the Standing Orders.

WEDNESDAY, FEB. 13.

The CAMBRIDGE GAS.—Petition for Bill referred to the Select Committee on Standing Orders.

The following Bills were read a second time and committed:—ABERDEEN POLICE AND WATER; AYR WATER; BARNSLEY GAS; BINGLEY EXTENSION AND IMPROVEMENT; BIRKENHEAD IMPROVEMENT COMMISSIONERS; DARTFORD WATER; DEWSBURY, BATLEY, AND HECKMONDWIKE WATER; DUNDEE GAS; DUNDEE NEW GAS; ETON GAS; HAMPTON COURT UNITED GAS; HERNE BAY WATER; KIRKCALDY AND DYSART WATER; LEEDS CORPORATION WATER; MANCHESTER CORPORATION WATER, &c.; MIDLAND RAILWAY (DERBY GAS-WORKS); MOLD GAS AND WATER; NEWCASTLE-UPON-TYNE AND GATESHEAD GAS; OTLEY LOCAL BOARD; PETERBOROUGH WATER; PLYMOUTH CORPORATION WATER, &c.; ROCHESTER, CHATHAM, AND STROOD GAS; ST. HELEN'S WATER; SALFORD BOROUGH; SCARBOROUGH GAS; SHEFFIELD WATER (AMENDMENT); SHEFFIELD WATER CONSUMERS; SOUTHPORT WATER; SOUTH SHIELDS GAS; SOUTHWARK AND VAUXHALL WATER; STALYBRIDGE GAS; STOCKPORT CORPORATION WATER; STRATFORD-UPON-AVON GAS; SUTTON, SOUTHCOATES, AND DRYPOOL GAS; WALLASEY IMPROVEMENT; WINDSOR ROYAL GAS; WOLVERHAMPTON NEW WATER; and WOOLTON GAS Bills.

A petition was deposited against the LEEDS CORPORATION WATER, from C. B. E. Wright and others.

THURSDAY, FEB. 14.

The ENFIELD GAS Bill was presented, and read a first time.

The Standing Orders applicable to the CAMBRIDGE GAS Bill were reported not to have been complied with; it was, therefore, referred to the Standing Orders Committee.

Petitions were deposited against the EAST LONDON WATER (THAMES SUPPLY) Bill, from the Vestry of the Parish of St. Pancras, and also by the Fulham District Board of Works;—against the IMPERIAL GAS Bill, by the Vestry of the Parish of St. Pancras, and also by the Fulham District Board of Works;—and against the WALLASEY IMPROVEMENT Bill, by Henry Pooley.

FRIDAY, FEB. 15.

In the case of the WIDNES GAS, WATER, AND IMPROVEMENT; SOUTHPORT IMPROVEMENT WATER; CRICKHOWELL GAS AND WATER; and SHEFFIELD WATER Bills, the Standing Orders Committee decided that the parties be permitted to proceed with their Bills.

The BRIERLEY HILL, QUARRY BANK, &c., IMPROVEMENT, and KIDDERMINSTER GAS Bills were read a second time, and committed.

Petitions were deposited against the EAST LONDON WATER (THAMES SUPPLY) by the Vestry of the Parish of Richmond;—against the KEIGHLEY WATER, &c., by Justices of the Peace for the West Riding of Yorkshire, others;—against ST. HELEN'S WATER, by Thomas Melling; and against the STOCKPORT CORPORATION WATER, by Messrs. John Grime Hughes and Sons.

SATURDAY, FEB. 16.

Petitions were deposited against the BIRKENHEAD IMPROVEMENT COMMISSIONERS, from the Hinderton and Birkenhead Turnpike Road Trustees;—against the EAST LONDON WATER (THAMES SUPPLY), from the Metropolitan and Saint John's Wood Railway Company, and from the Metropolitan Board of Works;—against the EAST LONDON WATER (VARIOUS POWERS), from the Metropolitan Board of Works;—against the IMPERIAL GAS, from the Metropolitan Board of Works;—against the SHEFFIELD WATER CONSUMERS, from John Marshall and James Marsh; from the Company of Porprietors of Sheffield Water-Works; from Edward Cayley and James Campey Laycock;—and against the SUNDERLAND EXTENSION AND IMPROVEMENT, from the Sunderland and South Shields Water Company.

Legal Intelligence.

VICE-CHANCELLOR'S COURT.

THURSDAY, FEB. 7.

(*Before Mr.* HALL, *Chief Clerk.*)

Re COLONIAL AND GENERAL GAS COMPANY, LIMITED.

Two summonses in this case came before Mr. Hall, one of the chief clerks of Vice-Chancellor Stuart, this day.

Mr. DAVIS, from Mr. Howard, solicitor to the liquidator, said that both summonses were for payment of calls. In the first case, no one appeared to oppose; and it was one of those cases in which they had not been able to serve the summons. He therefore produced an affidavit of service on the housekeeper at the last known place of residence, which was the only service that could be effected.

The CHIEF CLERK: Is not this a case in which personal service is required?

Mr. DAVIS: No, sir.

The CHIEF CLERK: Are you not going to attach?

Mr DAVIS: Yes, sir, when we have obtained the order; and personal service will then be required, but not at present.

The CHIEF CLERK: I think that service will do.

Mr. DAVIS produced an affidavit of his inspection of the books of the company, showing that the person summoned—who, as he described him, was "one of the precious promoters, and one of those who had brought the company to grief"—had, after several transfers, six shares still standing in his name, on each of which two calls of £5 each were due, making £60 in all. He said the share-ledger had been kept in such an irregular manner that it was almost impossible to deduce from it a clear analysis of the state of the person's accounts; but he produced the share-register. By this it appeared that he was in arrear as stated by Mr. Davis, although the payments which he had made were in part upon some calls and in part upon others.

The CHIEF CLERK: As he does not choose to come and explain the matter, you must take the order.

Mr. DAVIS said the next summons was against an advertising agent in the City.

Mr. TAYLOE said he appeared for the gentleman who was alleged to be a contributory, and he was brought here to show why he should not be put upon the list.

Mr. DAVIS said there was no list of contributories, this being a voluntary winding up under supervision. These calls were made before the winding up.

The CHIEF CLERK: This is not a compulsory winding up.

Mr. DAVIS: It is not a call made by the judge on a settled list of contributories; these are arrears of calls long due, and made by the directors.

Mr. TAYLOE: But you are seeking also payment of a call made by the liquidator.

Mr. DAVIS: No; I am only seeking payment of the second and third call made by the directors on 26 shares.

Mr. TAYLOE: I think you are bound by the Act of Parliament to settle a list of contributories.

The CHIEF CLERK: No; not in a voluntary winding up. You know in a voluntary winding up the court does not do anything unless it is asked. This is a winding up under supervision.

Mr. DAVIS: Yes.

The CHIEF CLERK: Then, the official liquidator settles a list of contributories, and, if you are dissatisfied with being put on the list, then you must come and ask that your name may be taken off; otherwise, we do not settle the list in chambers.

Mr. DAVIS: I stand in this position: in a compulsory winding up, the proper course is for me to come here; in a voluntary winding up, the simple course is for the liquidator to bring an action; in a voluntary winding up under supervision, I can either bring an action or come here for an order. If I took action at common law, and went down to Westminster, and produced the share-ledger, showing that the defendant had not paid the calls on the shares standing in his name, and showed that the calls had been properly made, my case would be made.

The CHIEF CLERK: If you are upon the share-register as the holder of shares with arrears of calls unpaid, I think it is a matter of course that the order goes.

Mr. TAYLOE: I certainly thought that we were called upon to show cause why we should not be settled upon the list of contributories.

The CHIEF CLERK: No; you have already agreed to take shares.

Mr. DAVIS: And paid money upon them.

The CHIEF CLERK: How many shares are there?

Mr. DAVIS: Twenty, six with calls unpaid of £10 on each.

The CHIEF CLERK: Of course you are able to prove the allotment to him.

Mr. TAYLOE: We do not dispute that. We did not apply for them. We took them in payment of a debt; but we do not dispute the allotment.

The CHIEF CLERK: The first call was paid, and the second and third are due.

Mr. TAYLOE: These shares were given to us to write off a part of our debt. We laid out good money, and only got bad shares in return.

Mr. DAVIS: You should not say bad shares, because this is one of the gentlemen who brought it to grief.

Mr. TAYLOE: Do not say that; we advertised the company, and paid out money.

The CHIEF CLERK: You would have taken the benefit if the concern had turned out well.

Mr. TAYLOE: If you are against me on the point of a list of contributories not being necessary, I must ask for an adjournment. I certainly thought we should be called on to show cause why we should not be put on the list.

The CHIEF CLERK: But these calls were made before the winding up, under the authority of the directors, the directors then having authority under which you were bound.

Mr. TAYLOE: But if I could have substantiated the reason why I should not be put upon the list, that would have carried me back beyond.

The CHIEF CLERK: How can you do that, having paid the first instalment?

Mr. TAYLOE: We say we did not actually pay it. We took the shares, some being fully paid-up shares, and the others being stated to have a certain amount paid upon them, in discharge of a large debt due to us as tradesmen. As I am instructed, we never paid a farthing of money.

Mr. DAVIS: We are bound to go by the share-register. If people choose to take shares with £10 paid, in satisfaction of a claim, it is the same as if they paid the money on the shares.

The CHIEF CLERK: I do not think it will make any difference.

Mr. DAVIS observed that, if there were anything to show, it must have been known some time ago; and, according to the well-known rule of law, the contract should have been repudiated at once.

Mr. TAYLOE asked that the summons might be adjourned, in order to allow him to take out a summons to rectify the list, and to show cause why he should not be upon it.

The CHIEF CLERK: That is another question altogether.

Mr. DAVIS said he must ask for an immediate order, as the creditors were pressing for their money, and the liquidators did not see why these gentlemen should turn round after the winding up, and say they ought not to be on the list.

Mr TAYLOE said that the notices, although no doubt meant for his client' were addressed to another person.

The CHIEF CLERK: He has got them now.

Mr. DAVIS: They tried this in Overend and Gurney; but it would not do.

Mr. TAYLOE: If a summons is made out to A and addressed to B, A is not bound to assume that it was meant for him.

The CHIEF CLERK: But if A acts upon it?

Mr. TAYLOE: But we are not acting upon it; we are acting on a notice addressed to us. The notice to pay was not duly served.

The CHIEF CLERK: That is only a reason why you should have time for payment.

Mr. TAYLOE: It is a reason why you should adjourn the summons, to enable me to do what is necessary to rectify that list. I am instructed that there is very good reason for stopping that order. So recently as this morning I received a letter from my client, in which he holds out great hope that this summons will not be proceeded with.

Mr. DAVIS said there was not the least doubt of his proceeding with the summons; he should not show the slightest mercy to these people who came, after a winding up order, and sought to relieve themselves of their liability.

Mr. TAYLOE said his client was a creditor—a large creditor.

Mr. DAVIS said that, as had been decided in the case of Overend and Gurney, the creditors must pay on their shares, and come from their debts afterwards.

Mr. TAYLOE said that, unfortunately, they had taken the shares for the debts.

The CHIEF CLERK: I do not think that makes any difference; if the thing had turned out well they would have taken the profit. It might be some reason for mercy. I do not think you can make much of it; but if you think you can, you shall have the opportunity.

Mr. TAYLOE said he would not have asked for an adjournment unless he had very good reasons for supposing that he could make out a good case.

Mr. DAVIS said he must press for the order.

The CHIEF CLERK said he looked upon Mr. Tayloe's client as coming forward with a *bonâ fide* defence to the application, and he understood that the defence was that he wished to make application to be taken off the share list. It appeared that several shares had been transferred, and therefore he thought it would be a difficult case to make out.

Mr. DAVIS said it was mere folly to make such an application, considering the state of the register, showing that the party had dealt with the shares.

Mr. TAYLOE said it would appear that all the shares had been transferred, but, by an accident, the transfer was not registered.

The CHIEF CLERK asked if the accident was on the part of the directors?

Mr. TAYLOE said he would not go further at present than to say that the accident was on the part of the transferee; but the fact of the transfer was known to the directors and to the secretary, and it was not until after the winding up that any claim was made upon them for calls.

Mr. DAVIS could not see how that affected the case; as long as the name was upon the register the party was liable.

Mr. TAYLOE said he asked for an opportunity of getting off the register.

The CHIEF CLERK said he thought he must adjourn the summons.

Mr. DAVIS: In that case I must ask you to put him under terms to take out the summons forthwith—in 24 hours.

Mr. TAYLOE said he was quite prepared to take out the summons immediately, if it were thought advisable to put such terms upon him. It was only keeping up his friend's character of showing no mercy.

Mr. DAVIS said he certainly intended to make all parties pay who had helped to bring the company to grief.

The CHIEF CLERK said that if the statement of Mr. Tayloe were true, and he had no reason to doubt it, his client was not quite in the same position as some of the other parties.

Mr. DAVIS quite admitted that.

Mr. TAYLOE said they had advanced £600 or £700 to advertise the company, and they were to be repaid in cash; but there were no funds, and they were asked to take part in money and part in shares.

The CHIEF CLERK said that having taken the shares and dealt with them, the question was, would it be competent for him now to say that he ought not to be upon the register.

Mr. TAYLOE said the only ground for getting off would be that he had transferred his shares on a certain date to an individual.

Mr. DAVIS: Who was bankrupt ten days ago.

Mr. TAYLOE: That is since the transfer.

Mr. DAVIS: But the transfer was after he had executed a deed of inspection.

Mr. TAYLOE said he was not aware of that.

The CHIEF CLERK said he would adjourn the summons, but Mr. Tayloe must take out his summons within a few days.

Mr. DAVIS said they wanted to declare a dividend as soon as possible.

Mr. TAYLOE said they did not want any unnecessary delay.

The CHIEF CLERK: You must take it out by Saturday, and it will be returnable on Wednesday. This summons will be adjourned to Wednesday.

COURT OF QUEEN'S BENCH.

WESTMINSTER, WEDNESDAY, FEB. 15.

(*Before Mr. Justice* SHEE *and a Common Jury.*)

THE VICTORIA DOCKS GAS COMPANY *v.* BURTON.

Mr. T. JONES, Q.C., and Mr. BIDDER appeared for the plaintiffs; and Mr. GOUGH and Mr. BESLEY for the defendant.

Mr. BIDDER opened the pleadings. He said in this case the Victoria Docks Gas Company were the plaintiffs and William Burton was the defendant. The declaration stated that the company sued the defendant for the conversion of a quantity of their gas—to wit, 40,000 cubic feet—to his own use; and in a second count they sued for goods sold and delivered to the defendant, and for money due on an account stated. The defendant pleaded, first, that he was not guilty; and, secondly, that the goods were not the plaintiffs, and, as a further plea to the action, that he had satisfied the claim of the plaintiffs by payment.

Mr. T. JONES said the defendant was a publican, carrying on business at a public-house called the Town of Ayr, situated in the district supplied by the plaintiffs company. The sum for which the action was brought was a very small and unimportant one, but the principle involved in the case was of great importance. The defendant became a customer to the gas company shortly before the year 1864 on the terms on which gas was usually supplied, and had continued so down to the present time. It appeared that the consumption went on regularly down to the end of 1865, but at the close of the Christmas quarter of that year it was found upon inspection that the meter through which the gas passed was out of order, and that it did not register the quantity of gas which the defendant had burnt—in fact, it indicated that during the preceding three months there had been little or no consumption of gas at all. Now, the reason of this it was needless for him (Mr. Jones) to go into, although it was perfectly clear; but he would satisfy the jury completely that if the meter had remained in the state in which it was left when previously examined, at the close of the September quarter, it would have accurately measured the quantity of gas passed through it. The jury were no doubt aware that, in order for a meter to register the amount of gas supplied through it, a quantity of water was required to be placed in it, and it was necessary that the meter should be maintained in a certain position. It appeared that when the meter in question was examined, at the end of December, 1865, it was found to have been disturbed and displaced from the perpendicular, and somehow or other—it might be without any fault on the part of Mr. Burton—a quantity of water had been taken out of it. For this reason it did not register the gas that had been consumed, and this action was brought to recover the amount due to the company for the quantity of gas estimated to have been supplied to the defendant between the 29th of September and the 25th of December, 1865. He (Mr Jones) thought there would be no difficulty whatever in determining what that quantity was, because he would be able to show the jury that, for the corresponding quarter of 1864, the quantity of gas registered by the meter was 62,900 cubic feet, and for the quarter ending December 25, 1866, it was 67,700 cubic feet. Of course, as the meter

was prevented from registering for the quarter ending Christmas, 1865, they could not tell for certain what the actual consumption during that period was, but they could make a very tolerable estimate of it from the consumption in the corresponding quarters of the years 1864 and 1866. The plaintiffs, however, had given Mr. Burton a considerable benefit in making their estimate, which they put down at 50,000 cubic feet, which was upwards of 12,000 feet less than the actual consumption in 1864, and upwards of 17,000 less than that of the actual consumption of 1866. The defendant had made a payment on account of the gas consumed in the quarter in question, and disputed his liability to pay for anything more than the quantity which the meter actually registered. The point which the jury had to decide was, whether the defendant was bound to pay for the estimated consumption, and if so, there was a balance of £7 19s. due from him. He (Mr. Jones) did not think it necessary to trouble the jury with any remarks respecting the meter, further than this—that, as he was instructed, the meter was one constructed on the best possible principle known to science; it was a Parkinson's patent meter—a description of meter in very general use. There had been some complaint made to the plaintiffs as to the action of this meter, and, accordingly, it was examined and tested by the inspector appointed under the provisions of the Sales of Gas Act in the month of September, 1865. It was then found to be correct, and was acknowledged to be in every respect a perfect meter. The examination of the meter took place at the request of the defendant himself; and the person by whom it was examined would be called as a witness to speak as to the result of his testing. When, however, the state of the index was taken at the close of the following quarter, it was found, as he had stated, that it had ceased to register, or rather had registered only the ridiculously small quantity of about 15,000 feet, and this, the plaintiffs contended, was not owing to a less quantity of gas having been actually consumed by the defendant, but was owing to the derangement of its position and the abstraction of water. He did not know what was the defence intended to be set up to this action, but he supposed it would be said that the defendant actually consumed less gas that quarter than he had previously done. He would only add one word as to the circumstances under which the action was brought. It was not necessary to impugn the conduct of the defendant, and he did not propose to make any inquiry into that subject. The plaintiffs case did not call for such an inquiry on this occasion, and, unless the defendant was desirous to go into it, he should abstain from referring to the subject. The case he submitted was, that a quantity of the plaintiffs gas had been consumed which ought to be paid for; and, when the circumstances were proved, he believed the jury would be of opinion that they were entitled to the amount they claimed.

Mr. *John Wilton*, examined by Mr. BIDDER.

I am superintendent of the works of the plaintiffs at North Woolwich. The defendant has been supplied with gas by our company. The supply to him commenced in November, 1863, and continued during the years 1864, 1865, and 1866. During the quarter ending December, 1865, the defendant's business, as far as I saw, was carried on as usual. At that time it was my duty to examine the consumers meters, and to take their readings at the end of every quarter. The consumers are supplied according to the terms stated upon a card issued by the company, containing their regulations.

Mr. BIDDER: I call upon the defendant to produce his meter card.

Mr. GOUGH: We never had one.

Mr. BIDDER (to witness): Was Mr. Burton supplied in the usual way with one of these cards?

Witness: Yes.

Mr. GOUGH: Did you supply it?

Witness: I cannot say that I did.

Examination continued: I saw it in the defendant's possession. It was a similar card to the one now produced. It contains a regulation of the company that the meters are not to be interfered with. On the back there is a space for inserting every quarter a record of the state of the index. At the end of the quarter a bill is sent to the consumer charging him with the amount due for gas. In September, 1865, at the defendant's request, his meter was removed, and tested by Mr. Dethridge, the meter inspector. It was found to be correct, and was replaced in its position. When I saw it on the 29th of that month it was in good working order, and in a perfectly level position, with the right quantity of water in it. It stood upon a shelf which was let into the brickwork, and it was impossible for the shelf to be moved in any way. The next time I examined the meter was on the 30th of December, 1865. I found it then all on the slant; it was projecting three inches forward, and seven pints of water short. I looked at the index, and found that it indicated a consumption of only 15,700 cubic feet of gas. The effect of tilting a meter of that description forward in the way I have described would be to allow the gas to pass without being registered—the gas would pass through without having any effect upon the index.

Cross-examined by Mr. GOUGH: I was not in the habit of frequenting the defendant's house, but I often passed the outside in an evening.

Mr. GOUGH: I thought you were a gentleman of too much respectability to go in.

Mr. BIDDER: That does not say much for the character of the defendant's house.

Cross-examination continued: I examined the meter to take the state of the index in September, 1865, and it was removed to be tested at the request of the defendant. I have not heard that in December following the defendant made any complaint to the board as to the state of his meter. I saw the company's regulation card in the possession of the defendant every quarter when I went to take the state of the index. I will swear that I saw it there in September, 1865. It could not be found when wanted afterwards. The business of the company is not a very extensive one. We supply many public-houses; some about the same size as the Town of Ayr.

Mr. GOUGH: Now, can you tell me of any public-house of a similar size to this, the landlord of which pays an equal sum for gas to that paid by the defendant?

Mr. BIDDER: I object to that. The question has nothing to do with the case.

Justice SHEE: I do not see what it has to do with it. It does not follow that because the house is the same size that there is the same number of burners.

A JUROR: Or that they are lighted for the same number of hours.

Cross-examination continued: The people in the neighbourhood have not made complaints of their meters being out of order, nor of the quantity of gas supplied by the company. There has been no complaint of an insufficient supply by the Victoria Docks Company. If such complaints were made I should have been aware of them. No complaints have been made to me, and I have not heard of any having been made to the board.

Mr. JONES: We will admit any complaints if they are in writing; if not, you must take your own course.

Mr. GOUGH: They are not in writing. (To witness:) Then you never heard any complaints in the neighbourhood as to the quantity of gas supplied?

Witness: We have had slight complaints at times, but when we have gone to attend to them, we have usually found there was something the matter with the consumer's fittings.

Justice SHEE: Their fittings are such as they choose to put up themselves. You do not insist upon their being according to your requirements?

Witness: No.

Mr. GOUGH: You insist upon the meters being fixed according to your requirements?

Witness: We fix all meters.

Mr. GOUGH: You never find any complaints arising out of the state of the meters.

Witness: No.

By the JURY: Whether I saw the card or not in the defendant's possession, I always inquired for it. The meter was for 20 lights. We supply the meters, and make a charge for the hire of them. When the water is short in a meter a supply of gas cannot be obtained through it, if it stands perfectly level. It was impossible for this meter to have fallen forward from imperfect fixing. When I saw it in the slanting position it was not kept so by a wedge, but by the connexions, which were bent forward. As it was fixed originally the meter stood flat on the shelf.

Mr. JONES: My friend has asked you a question as to saying anything to the board about this. When this was discovered had you some conversation with the defendant about it?

Witness: Not till after I had consulted the board.

Mr. GOUGH: I do not think this arises out of my cross-examination. I only asked if there had been any complaints.

Justice SHEE: The questions were as to other qersons making complaints.

Mr. GOUGH: I asked whether it was at the request of the defendant that the meter was examined in September.

Mr. JONES: I shall have to ask qustions about a matter which I do not desire to go into.

Justice SHEE: There is no reason why you should not put this question. You can put it through me.

Mr. JONES: I want to know whether, after this gentleman discovered the condition of the meter, he did not make a complaint to the defendant about it.

Witness: Not till after I had consulted the board.

Mr. JONES: But, after you had consulted the board, did you make a complaint to Mr. Burton about it?

Witness: Yes.

Mr. JONES: At that time was Mr. Foulger with you?

Witness: Yes.

Mr. JONES: Now just state generally what occurred.

Justice SHEE (to Mr. Gough): You can cross-examine upon this, as it is new.

Witness: We asked Mr. Burton whether he could account for the meter being in that position. He said he could not, but he was willing to pay what was just. That is all, I think.

Justice SHEE: Was the alteration in the position of the meter such that it could not escape your observation?

Witness: It could not; it was so plain.

Justice SHEE: I want to know in what way the slanting of the meter would affect the index.

Witness: The meter standing forward in this way, the gas passed through without being registered at all, and to effect the passage of the gas the water had been drawn off.

By the JURY: The seven pints of water could not possibly have escaped by itself—evaporation would not have gone on to that extent.

A JUROR: I should almost have thought that this quantity of water being taken ont it would prevent the defendant getting a sufficient light.

Witness: He could not have done it if the meter had stood perpendicularly; but the meter being out of the upright, and the water drawn off, the gas passed through and was not registered. That is according to Mr. Parkinson's report.

Mr. JONES: Did the same meter go on correctly after being readjusted and having had more water put into it, and has it gone on ever since?

Witness: Yes; and it is registering correctly at the present time. We have had it since tested, and found to be correct.

A JUROR: What would have been the effect if the water had been drawn off and the meter not tilted?

Witness: They could not have got any gas because the inlet-pipe would be stopped up.

Mr. GOUGH: And what would be the effect upon the supply of gas by the meter being in the state in which you say it was in December, 1865? Would it not have interfered with the supply?

Witness: No.

Mr. GOUGH: Not in the least?

Witness: No.

Mr. JONES: What was the reading of the meter at the end of September, 1865?

Witness: It showed a consumption during the quarter of 27,850 cubic feet.

Mr. *George F. L. Foulger*, examined by Mr. JONES.

I am a collector in the service of the company. I have the rental-book with me. I collected the amounts paid by the defendant for gas from March, 1864, down to September, 1866, and gave him receipts for the sums so paid. [Receipts called for and produced.] For the Christmas quarter, 1864, the consumption of gas was 62,900 cubic feet. For the Christmas quarter, 1866, the consumption was 67,700 cubic feet. The intermediate quarters, being summer quarters, are for less quantities. The company's inspector delivered bills to the defendant debiting him with these amounts. The receipts produced are for the sums paid by him during those periods. He was charged upon an estimated consumption of 50,000 cubic feet for the Christmas quarter of 1865, and he has paid, on account of that charge, all but a sum of £7 19s., which makes it as if his consumption that quarter was only a little over 15,000 cubic feet. The £7 19s. is the amount the company are now seeking to recover.

Justice SHEE: I do not know how it was the case came here then.

A JUROR: That is just the remark we were making amongst ourselves.

Mr. JONES: My lord, there is a great deal more in the case, very likely. You have not yet heard the defendant's statement.

A JUROR: That will not alter the sum.

Mr. JONES: No; but there is a great deal to tell about it. (To witness:) Were you present at the interview between Mr. Wilton and the defendant?

Witness: Yes.

Mr. JONES: You heard what Mr. Wilton said took place at that interview? Is that correct?

Witness: Quite correct.

Cross-examined by Mr. GOUGH: I have been a collector for the company since Midsummer, 1865. If there are any arrears of rental left due, they would be added to, and collected with the account of the succeeding quarter, and the receipt given would specify the whole quantity of gas for which the amount was paid.

Mr. *Henry Mitchell*, examined by Mr. BIDDER.

I am an inspector of meters in the service of the company. About the 14th of September, 1865, I went to Mr. Burton about his meter, with reference to having it tested; and it was arranged between us that it should be taken to the inspector for examination. That was done, and the meter was found perfectly correct. It was replaced on the shelf in Mr. Burton's house the same day, and properly fixed there; perfectly level. It was also supplied with water up to the level of the water-line. I next saw the meter on the 31st of December, 1865. It was then standing three inches out of the upright. I took out the overflow-plug and found no water came out, showing that the meter was dry. The first effect of tilting a meter of that description into the position in which I saw it, would be to cut off the supply of gas, because the inlet would be flooded. Afterwards, in order to get a light, it would be necessary to withdraw the overflow-plug, which is at the bottom of the meter, and let out the water. In that way the gas would be obtained without affecting the index, which would cease to register. It is my duty to take the readings of the company's meters. I have done so with the meter at Mr. Burton's house. For the quarter ending at Christmas, 1866, there was a consumption shown of 67,700 cubic feet.

Mr. *William Coulson Parkinson*, examined by Mr. JONES.

I am a member of the firm of William Parkinson and Co., the makers of the meter in question. It was a patented invention, but the patent expired a long time ago. It is a well-known description of meter.

Mr. JONES: I need not ask you your opinion about it, but will you be good enough to say what effect—we need not go very largely into the question, as there has been no cross-examination on the point—but what would be the effect of tilting this meter, or taking the water out of it?

Witness: You would have to do both operations, and in that case the meter would cease to register, and the gas would pass through without any indication.

Mr. *George Dethridge*, examined by Mr. BIDDER.

I am one of the inspectors of meters appointed under the provisions of Sale of Gas Act. On the 22nd of September, 1865, a meter was brought to me to be tested by the witness Mitchell and the defendant. I tested it according to the rules laid down in the Act, and furnished the defendant with a certificate that I had done so, and found it perfectly correct. The meter had been previously examined and stamped by the city inspector.

This was the plaintiffs case.

Mr. GOUGH submitted to his lordship that the plaintiffs must be nonsuited on the following grounds:—If the learned judge would refer to the evidence of the witness Mitchell, he would find it stated that the effect of the tilting of the meter would be to cut off the supply of gas, and then, that in order to get gas again, it would be necessary to withdraw the overflow-plug and let out the water. Now, there was no evidence whatever that this plug had been removed.

Justice SHEE: Even if that be so, I do not think it would go to a nonsuit.

Mr. GOUGH: There is no proof that there was any gas supplied at all.

Justice SHEE: I understand the case which the plaintiffs present is this—during a certain number of quarters, and particularly during the two quarters ending December, 1864, and December, 1866, a certain quantity of gas was consumed through this meter; that during the year 1865 the business of the defendant was carried on in the same way as it had been previously, and was subsequently; but that during the quarter ending December, 1865, from some reason or other, through some accident to the meter or otherwise, there was little or no registration of the gas consumed. And they present this case to the jury—through this meter, in the quarter ending on the 25th of December, 1864, there had been a consumption of 62,900 cubic feet of gas, and in the quarter ending on the 25th of December, 1866, there had been a consumption of 67,700 cubic feet; but when this meter was out of order in the quarter ending the 25th of December, 1865, only 15,700 feet of gas appear to have been consumed. And they say that this is owing to the derangement of the meter, or some cause for which they are not responsible; and then they say, we will not charge the defendant, or seek to recover from him, an amount representing the consumption in 1864, of 62.900 feet, or the larger consumption of 67,700 shown in 1866, but we will take a much smaller quantity—50,000 cubic feet—and we ask the jury to infer from the facts stated that this quantity must have been consumed. That is the case. It may not be a complete case without some observations upon it to the jury——

Mr. GOUGH: I submit that they have not proved there was any such consumption as they seek to charge for.

Justice SHEE: They have proved conclusively, as I understand it, that, the meter being correct, in 1864 the consumption for the quarter ending Christmas was 62,900 feet, and in the corresponding quarter of 1866 it was 67,700 feet. I do not know whether they have given the intervening quarters.

Mr. BIDDER: At the 25th of March, 1865, it was 37,000; on the 24th of June, 25,700; 29th of September, 27,800. Then comes the quarter in question, when, the days getting darker, the consumption, of course, was greater.

Mr. GOUGH: Still I submit the plaintiffs case on this point ought to be supported by proof, and not assumption.

A JUROR: We think we ought to hear whether the defendant had gas or not.

Mr. JONES: Mr. Wilton proved that the business was carried on and the gas lighted as usual.

Justice SHEE: What he said was—the business of the defendant was carried on the whole time as usual.

Mr. JONES: And upon that there was no cross-examination.

Mr. *Mitchell* recalled, and examined by Mr. JONES.

It is my business to go through the whole of the company's district two or three times, at least, every week, and along the front road where the defendant's house is I pass every day. From November, 1864, to the present time I have seen no difference in the way in which his business was carried on. The gas has been lighted as usual. I go round the district after the lamps are lighted.

Justice SHEE: Can you speak positively as to the state of things between the 29th of September and the 25th of December, 1865?

Witness: Not more than I have done.

Justice SHEE: Did you pass the defendant's house during that time?

Witness: I did.

Justice SHEE: Did you make any observations as to whether the house was lighted up?

Witness: It was lighted just the same as usual.

A JUROR: And as much gas being used as in the quarter before?

Witness: Quite as much.

Cross-examined by Mr. GOUGH: I think it very likely that I went into the defendant's house during that time, but I cannot swear that I did. I do not know how many rooms there are in the house.

Mr. GOUGH: I submit that this witness does not help the plaintiffs at all.

Justice SHEE: You may succeed in persuading the jury of that, but you will not persuade me. I think there is some evidence, at all events.

Mr. GOUGH then addressed the jury for the defendant. He said, whatever the opinion of the jury might ultimately be, as to whether the plaintiffs were entitled to recover this small sum of money or not, there could be no doubt upon one point—and, indeed, the jury, by an observation which fell from them, had already anticipated the remark—that the present action ought never to have been brought in one of the superior courts. It was a very great shame that when an Act of Parliament had established tribunals for determining these small questions between party and party, a gas company, because they were in possession of large funds, and could afford to go to considerable expense, should be allowed to prosecute an unfortunate man like his client, by bringing a claim of this nature into a superior court, and thus run up a heavy bill of costs. And now he would ask the jury to look at the case which was really presented to them. The plaintiffs appeared to have carried on their business in somewhat a loose way, because, as the jury had heard from the evidence of one of the witnesses, if a sum of money was left unpaid from one quarter, it was carried on and included in the account of the next quarter, and of course the consideration for that sum of money was carried on likewise, and when the money was paid the receipt was given for the whole in a lump. That being so, how could the jury rely upon the receipts brought forward to prove, by a sort of analogy, that because a certain individual was supplied with a certain quantity of gas in one quarter, he was supplied with the same quantity in another. And that appeared to be their whole case. But what really was the evidence as to the quantity of gas consumed? There was none at all. The witness who was called as the company's inspector considered that inspection consisted in walking up and down the streets. He would not swear that he had ever been in the defendant's house; he did not know how many rooms it contained, nor how many burners had been lighted at the time in question. He (Mr. Gough) would be able to show that a much smaller quantity of gas was consumed that quarter than there was before or had been since. As to the position in which the meter was found, the jury did not know whether, for a considerable period, the defendant might not have been wholly without gas in consequence, or whether the shifting of the meter might not have been a gradual thing, resulting in the defendant getting a smaller and still smaller supply of gas day by day. Whatever might have been the cause of this alteration of the position of the meter, he should contend that the plaintiffs had given no evidence of any kind to support their charge for this large consumption of gas, and he would show, on the contrary, that during the period referred to the defendant actually did not burn that quantity. Upon the whole case he should submit that the verdict must be for the defendant, there being no sufficient proof on the part of the plaintiffs that they were entitled to the trivial amount for which they sued.

Mr. *William Burton*, examined by Mr. GOUGH.

I am the defendant in this action, and carry on business as a licensed victualler at the Town of Ayr public-house, North Woolwich. The claim upon which I am sued is for gas supplied to me from Michaelmas to Christmas, 1865, by the plaintiffs. Ever since I have been down in the neighbourhood of the Victoria Docks I have been making complaints as to the quantity and quality of the company's gas. Either in or immediately before the month of September, 1865, I made complaints to the company as to the state of my meter. I complained to the cashier, the inspector, and the managing man, one after the other. In 1864 I went down to the factory, and saw the manager there, and I said there must be something wrong; I never could have consumed so much gas as they had charged against me. I cannot jog my memory as to what time of the year it was. I made complaints of the quantity and quality of the gas also in 1864. They sent me in an account which was quite unsatisfactory, and I never had a card from that day to this. I am the proprietor of another public-house—the White Swan, in the Blackfriars Road—which is now superintended by my wife. I first took that house in 1861, and it was managed by my family until Michaelmas, 1865, when my wife came up to attend to it solely on account of my son being taken ill. When my wife left the Town of Ayr I discharged two servants, and curtailed the consumption of the gas. I am not quite sure how many burners I had before that, but I should think about 34. They were all fishtails, except 8 little nibs, which used to be alight all night for the sailors, who were in the habit of smoking, to save their burning candles. There is a very large dancing-room in the house, which was lighted by 8 burners, and the very day my wife left, which was the 13th of September, 1865, I shut up that room, and it has been kept closed to the present time. I also left off taking any lodgers in, and I shut off the sailors lights, each one of which I considered consumed about as much gas, burning all night, as one of the dancing-room lights. I never had a card of the company's regulations, but they promised me one. Mr. Wilton never saw one in my possession, nor has he ever asked to see it.

Cross-examined by Mr. JONES: I never had a card given to me showing what the indications of the meter were every quarter. I do not know whether my wife had. I was out at that time travelling for a brewer. I do not know whether my daughter ever had a card given to her. I do not believe there ever was one left at the house. There were papers sent to me charging for the quantity of gas consumed. I altered the style of my business at the Town of Ayr from the time my wife left, on the 13th of September, 1865, and the lights which were then extinguished were not lighted again till my son-in-law went down there last quarter. There was a smoke-room upstairs where we used to have foreign gentlemen—that room was lighted with 6 fishtail burners, but it has been shut up since September, 1865.

Mr. JONES: I wish to know whether, since September, 1865, you have not put some lights in again?

Witness: Oh, decidedly not.

Mr. JONES: You swear that?

Witness: I do swear it.

Mr. JONES: That from September, 1865, to the present time, your business has been going on with a diminution of 8 lights in the drawing-room, 6 lights in the smoke-room, and 8 nibs in the sailors room.

Witness: Yes; and there is another thing. There were always two lights burning all night when my family were there, and these were done away with at that time.

Justice SHEE: Then, as I understand it, there were altogether 26 fewer lights after your wife left in September, 1865?

Witness: Quite so.

Justice SHEE: And that has been so ever since?

Witness: They may have been lighted up occasionally about one or two nights a week, but not more. There was a Foresters' lodge in the house, and when they met there would be two burners lighted for two or three hours.

Mr. JONES: Have you always on all occasions made this statement? Have you ever made this statement before a court of justice?

Witness: Any statement similar to what I am now making?

Mr. JONES: Yes.

Witness: I have never had occasion to do it.

Mr. JONES: Well, you know there were some proceedings, which I will not further advert to, respecting this meter?

Witness: Oh, yes; no doubt about that; and that is what these proceedings have arose from.

Mr. JONES: Now, I am going to ask this very seriously. Did you not on that occasion (without adverting further to it) state that, during the quarter ending at Christmas, 1865, there had been a much larger consumption of gas than was registered by the meter?

Witness: No; I had not consumed so much.

Mr. JONES: I ask, did you not admit on that occasion that a larger quantity of gas had been consumed than was registered by the meter?

Witness: Decidedly not.

Mr JONES: You swear that.

Witness: I do swear it.

Mr. JONES: Did you on that occasion make any statement to the effect that the quantity consumed in the Christmas quarter, 1865, had been less than usual?

Witness: It had been less.

Mr. JONES: No, I am not asking you that; I am asking whether on that occasion you did or did not say that the quantity consumed in the Christmas quarter had been less than usual?

Witness: No.

Mr. JONES: Or more than usual? Did you make any statement concerning it?

Witness: I complained of not having enough.

Mr. JONES: I am speaking of what you then said. Did you then say that the consumption had been as great, or might have been as great, as in the Christmas quarter, 1864?

Witness: I grumbled about——

Mr. JONES: No; that is not what I ask. This has been all taken down, and I am going to ask you specifically this question, and what you said there may be adduced against you: I want to ask—having told you that—whether you did not say or admit then that the consumption might have been as great in the Christmas quarter, 1865, as in the Christmas quarter, 1864? Now, answer that question if you please.

Witness: They brought me a bill to that effect, making no difference between 1864 and 1865.

Justice SHEE: You perfectly understand the question I should think. Did you state on any occasion that the consumption in the quarter ending Christmas, 1865, might have been as great as in the quarter ending Christmas, 1864?

Witness: No; I do not recollect that I ever did.

Mr. JONES: Did you say it might be?

Witness: No; I did not.

Mr. JONES: Did you say it was less?

Witness: No; but I looked for less, doing away with so many burners. I was dissatisfied at seeing such heavy bills come in for 1865, as there had been in 1864——

Mr. JONES: Without going into the circumstances of the occasion, which was a disagreeable one——

Mr. GOUGH: If you mean to impute anything, impute it.

Mr. JONES: I do not impute anything. You know the occasion I mean—that was after the complaint made against you as to the position of the meter?

Witness: Yes.

Mr. JONES: That was early in 1866, was it not?

Witness: Yes; somewhere about then.

Cross-examination continued: I did not attend to that house myself much, I left it to my wife and family up to September, 1865. I do not suppose I turned the meter on half a dozen times while I was there; I left it to my potman. I knew the meter was taken down and inspected; but my attention was never called by the company's servants to the fact that it was afterwards found 3 inches out of the perpendicular. I had nothing to do with shifting it. I might have seen it as I passed in the cellar; I did not observe that it was out of place, and I do not believe it was. A complaint was made to me by Mr. Wilton about it. I said to him, in the presence of Mr. Foulger, that I would pay anything in reason, or anything just; but such an account as this I would not, and then he called me a thief, and said I was robbing the company. That was about one or two months after my wife left that house.

Re-examined by Mr. GOUGH: I have burned gas for many years. I have been supplied at my other house by the Phœnix Company since 1851. I do not know whether there was any deficiency of water, or whether the meter was tilted at the Town of Ayr; I am quite sure I am innocent if it was. I reduced the number of my lights in 1865. There may have been six or eight of those burners lighted since once or twice a week.

Justice SHEE: Six or eight out of the 26?

Witness: Yes.

A JUROR: It has been said that the index of the meter showed a consumption of 67,700 cubic feet of gas for the quarter ending Christmas, 1866. Was that after you had made all these reductions in the number of burners?

Witness: Quite so.

Another JUROR: And the meter was correct in 1866?

Witness: The meter was replaced after they said it was 3 inches out of order. They put it right themselves, and never called my attention to it.

Justice SHEE: Never called your attention to the fact that the meter was out of order?

Witness: Never, my lord. I was down in the cellar when Mr. Wilton came, and my daughter called me up. Mr. Wilton said, do you know what you have done? You have been robbing the gas company. You are nothing but a thief. I felt in that way that I thought I should knock the fellow down. I assure you, gentlemen, I never touched the meter. I was out all day.

Justice SHEE: But I want to know this. It now appears, though nothing has been said definitely about the disagreeable circumstance, that a formal complaint was made about this meter being out of place, and you were called upon for an explanation; but we are not judging that question now. What I want to know is this—before that formal complaint was made against you, and you were called upon to answer it, was your attention personally called by the officers of the company, either Mr. Wilton or the inspector, to the state of the meter?

Witness: Never.

Justice SHEE: Were you ever asked to go and look at the meter?

Witness: Never; not a word was said about it. When they called me out of the cellar, they said, "Are you aware that your meter is 3 inches tilted?" I said, "No." They said, "Are you aware it is 7 pints of water short?" I said, "No."

Justice SHEE: Did they show you how it was?

Witness: No.

Justice SHEE: You say you do not believe the meter ever was out of order?

Witness: I do not. I had been making complaints about the bad quality of the gas, as were other inhabitants, and the company summoned me to Ilford on a most disgraceful charge.

A JUROR: As I understood the first witness, he did not call the attention of the defendant to the state of the meter till he had made a complaint to the board.

Mr. JONES: He said he consulted the board first.

Another JUROR (to witness:) Why did you not go and see whether the meter was tilted when he accused you? I should have gone down with him.

Witness: I did go down after they accused me, and saw there was nothing the matter; it was perfectly level.

Mr. *Wilton* was recalled, and, in answer to the judge, said, the meter was readjusted the day after it was discovered to have been tilted. It had been set straight before I had the conversation with the defendant. The reason we did not call his attention to it before was, that we never could find him at home. There was no one in the house but his daughters.

Henry Spittal, examined by Mr. GOUGH.

I reside at 127, Blackfriars Road, and am a gas-fitter. I was called in by the defendant to examine his gas-fittings and meter on the 21st of January this year. I examined them very carefully. I have not heard the amount charged to the defendant for gas.

Mrs. *Burton*, wife of the defendant, was called, and sworn.

Mr. GOUGH, however, declined to examine her, as he said he found she could prove nothing except that she left the Town of Ayr in 1865, and had been keeping another public house since.

Witness: I left on the 13th of September, 1865. The bed-rooms were then all shut up. There were 17 bed-rooms.

Mr. GOUGH: Never mind that.

Mr. JONES: Did you never see a card like this in your house?

Witness: Never; we wrote for one two or three times.

Mr. JONES: You never went where the meter was?

Witness: Yes; many a time.

Mr. GOUGH briefly summed up the evidence for the defence, and

Mr. JONES replied upon the whole case. He said his learned friend had not repeated the statement with which he started, and he thought he had very wisely abstained from doing so. His first proposition was that the plaintiffs had no right to bring their action in this court, but that for so trumpery an amount they ought to have sued the defendant elsewhere. The plaintiffs were quite alive to this consideration; and if the law were such that they really ought to have gone elsewhere, they would be sufficiently punished, even should they obtain a verdict for the amount of their claim, by the consequences which must inevitably follow. But that had nothing at all to do with this question. The circumstances under which they had brought their action here were sufficiently justified by the nature of the defence which the defendant had set up—a defence which they had good reason to anticipate. That defence he did not scruple at once to brand with its true character—it was absolutely false and fraudulent. It was because they anticipated such a defence, and they desired to have the opinion of a jury sitting under the presidency of a magistrate capable of well guiding them, that they brought their action in a superior court, and he believed the verdict of the jury would justify the propriety of the course they had adopted. What was the defence set up? The defence condemned itself. The defendant said that of the 34 burners in his house 26 had been put out of use from the end of September, 1865, to the present time—that is, that during the winter quarter of 1865 and the winter quarter of 1866 there were only 8 burners going. His learned friend had not thought fit to examine the defendant's wife in confirmation of this statement, nor any of the servants in the house. But what became of such a statement when it was admitted that the defendant had since paid quarterly accounts for larger sums than would be due for such a consumption of gas? The defendant did not see the effect of his statement, or he would not have made it. In the quarter immediately succeeding the quarter in dispute the consumption of gas was 43,000 cubic feet, and that quantity the defendant had paid for. For the summer quarter of 1866 he paid on the footing of a consumption of 28,000 cubic feet; for the Michaelmas quarter on the footing of a consumption of 37,000 cubic feet; and the consumption for the last quarter of 1866 was 67,700 cubic feet. No one would believe he would continue to make these payments knowing, as he said, that the number of his burners was reduced from 34 to 8, at the time he was resisting a payment for the winter quarter of 1865 upon an estimated consumption of 50,000 cubic feet. He (Mr. Jones) submitted that on his own showing the defendant's case was entirely contradicted. He regretted that the matter had required to be discussed in the way it had been, but it really became a matter of importance to the gas company that they should make known to the defendant that if—he would not say a fraud was committed—but that if anything went wrong with his meter to prevent it telling the truth as to the actual consumption of gas, that circumstance was not to be made available as an excuse for non-payment of their account.

Justice SHEE said he did not find among the papers handed in a receipt for the quarter ending in June, 1866, nor for the following September quarter.

Mr. JONES said he believed if the defendant was recalled, he would say that he was summoned for the amount.

After some conversation, Mr. *Foulger* was recalled, and, in answer to the learned judge, said, the gas-rent for the quarter ending at Midsummer, 1866, was paid by the defendant to the secretary of the company; the account for the Michaelmas quarter was disputed, and the amount afterwards

paid into the county court; and the account for Christmas last was not yet paid. On account of the quarter in dispute, the defendant had paid £14, leaving a balance of £7 19s., the sum now sought to be recovered.

Justice SHEE having summed up the case,

The jury deliberated in the box for a few minutes.

The FOREMAN then asked whether his lordship would take the verdict of eleven.

Justice SHEE said he could not do so unless both parties agreed to accept it.

Mr. GOUGH said he was willing to do so, but

Mr. BIDDER said his clients desired to have a unanimous verdict.

The jury thereupon retired, and, after an absence of an hour, returned into court with a verdict for the plaintiffs for the amount claimed.

COURT OF EXCHEQUER.

WESTMINSTER, WEDNESDAY, JAN. 16.

(Sittings in Banco, before Lord Chief Baron KELLY *and Barons* CHANNELL *and* PIGOTT.)

COOPER *v.* WOOLLEY.

THE SMOKE NUISANCE PREVENTION ACT.

Mr. MELLISH, Q.C., and Mr. BERESFORD appeared for the appellant; and Mr. KEANE, Q.C., and Mr. DUGDALE for the respondent.

This was a case stated by a police magistrate for the borough of Birmingham for the opinion of the court. It appeared from the case that by the Birmingham Improvement Act, 1851, sec. 55, the 108th section of the Towns Improvement Clauses Act, 1847 (10 & 11 Vic., c. 34), was incorporated.

The 108th section is as follows:—

Every fireplace or furnace constructed after the passing of this Act, in order to be used within the limits of such Act in the working of engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, gas-work, or in any manufactory whatsoever (although a steam-engine be not used or employed therein), shall be so constructed as to consume the smoke arising from the combustibles used in such fireplace or furnace and every such fireplace or furnace existing within the said limits at the date of the passing of this Act used for the purposes aforesaid, not so constructed as to consume the smoke arising from such fireplace or furnace shall within . . . two years after the passing of this Act be so altered in its construction as to consume such smoke; and if after such period any person use for any of the purposes aforesaid any fireplace or furnace not so constructed as aforesaid, or if at any time any person use any such fireplace or furnace constructed after the passing of this Act, and not so constructed as aforesaid, or so negligently use any such fireplace or furnace as not to consume the smoke arising from the combustibles used therein, every person so offending shall be liable to a penalty of forty shillings for every day during any part of which such furnace or fireplace shall be so used or continued after one month's notice in writing shall have been given to the owner or occupier of such furnace or fireplace by the council to remedy or discontinue the same.

The 55th section of the Birmingham Improvement Act is as follows:—

The clause of the Towns Improvement Clauses Act, 1847, with respect to the prevention of smoke, shall be, and the same is, hereby incorporated with this Act; provided always, that the words "consume the smoke" in the last-mentioned Act shall not be held in all cases to mean "consume all the smoke," and that the justice or justices before whom any person shall be summoned may remit the penalties enacted by the said Act if he or they shall be of opinion that such person has so constructed or altered his fireplace or furnace as to consume as far as possible all the smoke arising from such fireplace or furnace, and has carefully attended to the same, and consumed as far as possible the smoke arising from such fireplace or furnace.

On the 13th of November Henry Cooper, the appellant, was summoned to answer the complaint of Robert Woolley, inspector of nuisances within the borough of Birmingham, the respondent, for that he, being the occupier of a certain furnace within the borough, did, on the 10th of October, so negligently use the furnace aforesaid as not to consume the smoke arising from the combustibles used therein, contrary to the said Act. It was proved, on the part of the respondent, that the furnace in question was one of the description called a "muffle," and that it was used for the purpose of annealing bars of copper and brass which were intended to be converted into wire, and that, though it was so constructed as to consume its own smoke, large quantities of smoke did, nevertheless, proceed from the chimney on the day in question, it being proved that for 41 minutes, during which it was watched by the inspector, there was a continuous stream of dense black smoke evolved, with two intervals only of three minutes each, during which the door of the fireplace was opened for the introduction of fresh fuel. It was also proved that the above quantity of smoke might have been very materially reduced by the regular admission of external air, either by partially keeping open the door of the fireplace, or by means of a ventilator attached to the under surface of the fireplace, but not used. It was contended by the respondent that the failure to admit such air constituted a negligent use of the furnace, and that by such neglect the appellant had rendered himself liable to a penalty. These facts were admitted by the appellant, but evidence was produced by him, and in the absence of satisfactory evidence to the contary, the magistrate found it to be true, in fact that if the external air were so admitted the temperature of the interior of the furnace would not be uniform, and that the process of properly annealing the metal for the purpose of making wire (uniformity of temperature being necessary) would be rendered impossible in the furnace used by the appellant. It was, therefore, contended by him that he had not negligently used the furnace, but that he had carefully attended to the same, and consumed as far as possible, consistently with the due carrying out of his trade (which he contended to be the true meaning of the Act), the smoke arising from the said furnace. The question was stated to be one of considerable importance to several other manufacturers of Birmingham and to the inhabitants generally, as it involved the necessity, unless some means could be devised whereby external air could be admitted to the furnace without injury to the metal, of either the disuse of muffles in the borough, or of the continuance of a nuisance to the inhabitants generally. The magistrate convicted the appellant in a nominal penalty, but stated the facts above set forth, asking the opinion of the court as to whether he was at liberty to adopt, and whether he ought to have adopted, the construction of the Act contended for by the appellant. If the court were of opinion that he ought to have done so the conviction was to be quashed.

Mr. MELLISH, for the appellant, submitted that this was not a conviction for not having a furnace so constructed as to consume its own smoke, but for negligent user of the furnace; so that it must be taken the furnace was properly constructed. It was quite clear, from the modifying proviso introduced, that the people of Birmingham did not choose to incorporate the whole of the clause of the Towns Improvement Clauses Act, because, though it might be important to them to have as little smoke as possible, it was more important that their trade should not be depressed. They said, "If we can keep our trade and yet diminish the nuisance well and good; let it be lessened, and let parties be liable for increasing it by mere negligence; but our trade must not be destroyed." That was plainly the intention of the proviso that "consume smoke" shall not be equivalent to "consume all smoke." The question submitted by the magistrate was, whether he would have been justified in acting on this proviso. The appellant had consumed the smoke as far as possible within the meaning of the Act if he had consumed the smoke as far as was possible, consistently with the due carrying on of his business; he could not, therefore, be convicted except for mere carelessness.

Baron CHANNELL: There is no finding of negligence here?

Mr. MELLISH: No; all that is found is that air was not admitted as it might have been. If it were possible to make a furnace which would consume its own smoke, and yet in which the metal might be properly annealed, then an information might perhaps lie for not having a properly constructed furnace; but that is not the complaint here.

Mr. KEANE, for the respondent, contended that the intention of the Legislature must be looked for in the language which it used, and there was nothing in this Act which gave power to carry on a trade, although it should be a nuisance to the town. The effect of the construction contended for by the appellant would be to insert in the Act the words "consistent with the due carrying on of the trade." The real intention of the proviso was this: At the time of putting fresh fuel into the furnace, and on other occasions, various accidents might arise under circumstances quite consistent with the fullest intention to act in accordance with the Act, and the exercise of all reasonable care, and smoke might casually and suddenly escape; with respect to such a state of things power was given to remit the penalty. It was to be observed that it was not provided that there should be no conviction. He said, therefore, that the meaning was not that the amount of smoke allowed to escape might be regulated by the exigencies of the trade, but that the manufacturer might escape penalties for a mere occasional and accidental escape. The duty of the owner of the furnace remained the same, notwithstanding the proviso, but he was not obliged to consume every particle of smoke—provided he had his furnace properly constructed, and consumed as much as he could; not, as his friend (Mr. Mellish) suggested, up to a certain point where it began to interfere with his trade. The result of that would be to make the Act nugatory; everybody would no doubt adopt a smoke-consuming apparatus: no one would use it further than he found it convenient for the purposes of his business. The magistrate had not found enough even in this point of view; he merely said the trade could not be carried on "with that furnace," and again that the case was of importance "unless some means could be devised." He did not say some other apparatus might not be found.

Mr. Mellish was not heard in reply.

Lord Chief Baron KELLY, in delivering judgment, said: I am of opinion that the appellant in this case is entitled to the judgment of the court. This information was laid under the 10 & 11 Vic., c. 34, s. 108, alleging that the plaintiff had so negligently used this furnace as not to consume the smoke arising therefrom. Undoubtedly by that section of the Act of Parliament any one guilty of an offence within the terms of that Act is liable to a penalty, but then a qualification is introduced by the 55th section of the Local Act, which provides that the justice may remit the penalties imposed by the Act, if he shall be of opinion that such person has so constructed his furnace as to consume all that is possible of the smoke arising from such furnace, and has carefully attended to the same. It is to be collected from the evidence, and from the case as stated by the magistrate, that this furnace is so constructed, not indeed so as to consume the whole, but so as to consume a great part of the smoke, but that the only mode by which the consumption of the smoke could be effected most fully was by the admission of external air under the circumstances and in the manner he points out. The charge really comes to this—that the defendant has so negligently used his furnace as not to consume the whole of the smoke; and the defence he makes is, that the furnace is so constructed as to consume as much of the smoke as can be consumed consistently with the carrying on of his trade or manufacture, and also that he has carefully attended to the same, and consumed as far as possible the smoke arising from such furnace. The whole question is as to the meaning of these words, "as far as possible." I apprehend that the meaning of these words in the Act of Parliament, "to consume, as far as possible, all the smoke arising from such fireplace or furnace, and has carefully attended to the same, and consumed as far as possible the smoke arising from such fireplace or furnace," mean, as far as possible, consistently with the carrying on of the trade or manufacture in question. Now, what is it the magistrate finds? He finds here that it is quite true the smoke might be made to be more fully consumed by the admission of external air in the manner he points out in the statement of the case; but then he says, "It is true, in point of fact, if the external air was so admitted, the temperature of the interior of the furnace would not be uniform, and that the process of properly annealing the metal for the purpose of making wire (uniformity of temperature being necessary) would be rendered impossible in the furnace used by the appellant." The substance of the whole is, then, that it is impossible for the appellant to carry on his business at all in the furnace if it be made to consume the whole of the smoke, and under these circumstances, inasmuch as the meaning I attach to these words, "as far as possible," is that they mean, "as far as possible consistently with the carrying on of the trade or manufacture of the party in question," I am of opinion that the ground for the information altogether fails, that there is no negligence, and that in the language of the Act of Parliament, the appellant has used his furnace, not negligently, but so as to consume as much of the smoke as was possible. No question arises about a nuisance, but the whole question is whether this is a violation of the Act. It would be, perhaps, a violation but for the qualifying clause in the local Act of Parliament. When we look to the qualifying clause, and see that the effect is to enable and authorize a manufacturer to use a furnace so as to carry on his trade, provided he consumes as much of his smoke as is possible consistently therewith, I think no offence has been committed within the Statute, and that the conviction must be quashed.

Baron CHANNELL: I am of opinion that the appellant is entitled to the judgment of the court, and that the conviction in this case ought to be quashed. Now the charge here is not an information for having a furnace not adapted to consume the smoke, but it is a charge in respect of the use of that furnace, and the use which is to lead to a conviction must be a negligent use, and that depends upon the two Acts of Parliament which have been referred to, the general Act and the 55th section of the local Act. I understand the question referred to the court is, whether we are of opinion that there was negligence or not with reference to the Act of Parliament. We are relieved in this case from a difficulty which sometimes arises, that where a magistrate of competent jurisdiction has found, as a matter of fact, one way, the Court of Appeal has not generally the power to take a different view of that which is a question of fact. Although in point of form there is a finding that the appellant has been guilty of negligence, I think the facts found sufficiently show that there has been no negligence within the

meaning of the Act of Parliament. It has been argued properly enough before us that it might not be sufficient for the present appellant to say that he was doing this for the benefit of his trade simply, and so as to get a larger profit than he otherwise would have done. If the introduction of external air in either of the modes pointed out by this case would simply have retarded the process of annealing, and rendered the operation longer, and the article more costly in its production, I am by no means satisfied that Mr. Keane's construction would not be the right one; but I draw a different conclusion from the facts of the case, and as it is found that the introduction of air in the mode suggested would prevent uniformity of temperature (which is a necessary thing in the manufacture), and thus render impossible the making of the article itself, I think the appellant is within the protection given him by these two Acts, and that there was no negligent use of the furnace within the language used in the Act.

Baron PIGOTT: I am of the same opinion. By the general Act it is provided that the fireplace must be constructed so as to consume its own smoke —that is the first thing; then the party must carefully use it, so that in fact it does consume its own smoke in operation. Then by the local Act it is provided that where it is so constructed as to consume, as far as possible, all the smoke, and it has been carefully attended to, in order to accomplish that object, in that case the magistrate may remit the penalty. In the present case there is no charge that this is not a properly constructed fireplace or furnace. The case certainly states that the process of properly annealing the metal would be rendered impossible by the adoption of the expedient suggested in the furnace used by the appellant; and it may be that it might have been better constructed for the purpose; but, be that as it may, that is not the complaint here; if that be the fact, it would be competent, of course, to make such a complaint, and have a conviction for want of proper construction. The question, however, here is, whether there was any negligence in the use of this furnace? Of course that implies that the party is entitled to use it for the purpose of properly carrying on his business. The facts stated show that it would not be possible to carry on this business by opening the flue in the way suggested by the respondent, and that was the only mode suggested. Where, then, is the negligence? The adoption of that mode of using the furnace would have put a stop to the business altogether, and I do not think the intention of the Act of Parliament was to do that. It is clear, therefore, that there is no negligence upon the facts as stated, and although the magistrate has found negligence, I understand him to ask us the question whether, upon the facts, he ought to have done so. I think there is no negligence, and, therefore, that the conviction ought to be quashed.

Judgment for the appellant.

TUESDAY, FEB. 12.

(*Sittings in Banco, before Lord Chief Baron* KELLY, *and Barons* MARTIN, CHANNELL, *and* PIGOTT.)

WARD *v.* THE GASLIGHT AND COKE COMPANY.

This was an action by the plaintiff for damage he had sustained by the destruction of Saville House, through the alleged negligence of the defendants servant, he being at the time of the occurrence the occupier of a portion of the premises. The case has been twice tried, and at the last trial a verdict passed for the plaintiff. During last term, Mr. Hawkins, Q.C., on the part of the defendants, applied to the court for a new trial, on the ground that the verdict was against the evidence, and upon affidavits setting out additional facts.

Lord Chief Baron KELLY now said: We have very attentively considered the affidavits which have been handed up to us, which were used in support of this rule, but, inasmuch as it has been intimated to us that other actions were pending against the same company, and upon precisely the same ground as the action in question, we think it would be better for the present to forbear from pronouncing any judgment upon the rule that is before the court, either to grant or refuse the rule for the present; and we trust before we meet again, when the rule may be further considered, that another trial may have taken place which will throw some further light on the true merits and the justice of the case. Therefore, for the present no judgment either to grant or refuse the rule will be given. The affidavits will of course be filed, so that all parties may have access so them.

Mr. POLLOCK: We are very anxious to see those affidavits, and they would have been filed except that they were in the hands of the court.

Lord Chief Baron KELLY: They will be almost immediately filed in due course.

GUILDHALL, MONDAY, FEB. 18.

(*Sittings at Nisi Prius, before Lord Chief Baron* KELLY.)

SMITH
PAGE
POTTS
STAGG
MORRIS
v. THE GASLIGHT AND COKE COMPANY.

These causes were set down for hearing before the Lord Chief Baron this morning. The whole of them are claims arising out of the Saville House fire.

On the special jury in the first action being called, only six jurymen answered to their names, one of whom begged hard to be excused. Great complaint was also made that the summonses in all the cases had been sent out so late that many had not been received till this morning.

Neither side prayed a *tales*.

Mr. HAWKINS, who appeared for the defendants, said that, even supposing the jury had been formed, he should have had to ask his lordship to postpone the trial, on the ground of the absence of a material witness. He held in his hand a certificate of the senior surgeon of Westminster Hospital, which stated that Mr. Cazally was now under his care, and that he was suffering from disease of the heart and nervous depression consequent thereon, and that the excitement of attending this trial and being examined as a witness would be likely seriously to endanger his life. As it was very important that this witness should be examined in court, he (Mr. Hawkins) had to apply that the trial should be postponed until the sittings after Easter term.

The SOLICITOR-GENERAL, who appeared for the plaintiffs, said he thought the application was rather late, and that it was not a little extraordinary the illness of Cazally was not discovered till the last minute. He was very anxious himself that this witness should be present, and that his evidence should not be taken on interrogatories.

Lord Chief Baron KELLY: It is quite clear we cannot proceed with the trial without Cazally.

The SOLICITOR-GENERAL said he had already mentioned to his learned friend that as the plaintiffs had been at great trouble and expense in bringing witnesses from abroad, he should ask, if the trial were postponed, that the evidence of these witnesses be taken on admissions, so that in the event of their being prevented attending the next trial, he might have the opportunity of reading their evidence. One of the witnesses had an appointment at the French Exhibition, and there would be great difficulty in getting him here again.

Lord Chief Baron KELLY said there could be no objection if the names of the witnesses were given. They should be examined forthwith on interrogatories.

Mr. HAWKINS thought the application was very reasonable.

The SOLICITOR-GENERAL said the witnesses he referred to were Larven and Roth.

After some discussion, it was arranged that the cases should be set down for trial on Thursday, May 16; the evidence of any witness on either side to be taken in writing forthwith, if considered necessary, to be used subject to the discretion of the judge who shall try the causes, in the event of the absence of either of such witnesses; and the trials to be further postponed if the judge should then be of opinion that the evidence of Cazally or Larven ought to be taken *viva voce*.

Miscellaneous News.

ETON GAS BILL.

On Friday afternoon, February 8th, a numerously attended meeting of the inhabitants of Eton, convened by the overseers, was held in the Girls School, High Street, to consider the Eton Gas Company's bill before Parliament—the Rev. F. E. DURNFORD in the chair.

The Rev. W. B. MARRIOTT moved the first resolution—"That in the opinion of this meeting the passing of the Eton Gas Company's bill now before Parliament would be highly prejudicial to the interests of the inhabitants of Eton—first, in respect of the new site to which it is proposed to move the gas-works; secondly, because the interests o gas consumers are not adequately protected under the terms of the bill, in face of what will become a complete monopoly of supply, should this bill become law; and, lastly, in respect of the extinction of Lammas rights without any adequate benefit to those interested in them." The facts of the case, the reverend gentleman said, were summed up in the motion, and almost spoke for themselves. He should studiously avoid any irritating topic, for which there could be no reason. The company had only looked after their own interests, in the same way as the requisitionists of this meeting must look after their own. There were three strong objections which presented themselves to a very large number of persons who took exception to the Eton Gas Company's bill. Taking first the third of them, the extinction of Lammas rights was a question upon which they need not say much; for if any great and decided benefit could be shown, such as that of the other day—the building of a church—they would all be willing to give up their rights over the land; but if he could show that in this instance there was no such benefit, but that, on the contrary, a very serious injury would accrue, it would follow that the ground so stated was a strong one for opposing the present bill. The second ground of objection was that of an inadequate protection to gas consumers. Eton had now two gas companies supplying it; some people preferred the Windsor gas, others that of Eton; and if the consumers were supplied with bad gas they had the safeguard and satisfaction at least, if not doing, of threatening to leave the one company and to go to the other. The inhabitants were able to choose whether they would pay 5s. or 6s. 6d., which he believed to be the present prices; but if this bill passed, the Eton Company would have the absolute power to charge the consumers anything under 7s. 6d. per 1000 cubic feet. If the bill passed there would be a virtual monopoly. It was not right that consumers of gas should be placed in such a position, as really to be at the mercy of the company. Another point was in respect of the new site, relatively to the school buildings, to the town generally, and to the Sanatorium. There was one particular part of the neighbourhood of Eton which, more than any other, consisted of a sort of magazine for freshened life and air for the schools and the town; for the freshening breezes came from the fields open to the west and to the river. In the very eye of this healthful magazine the gas company proposed to place gas-works, on the very plea that in the out-of-the-way corner where they now are they have been found offensive. It was proposed to place the works upon the favourite promenade ground for residents and recreation ground for the Eton boys, and close to the railway which brought visitors to Windsor and Eton. A few years ago, at a very great expense, the Sanatorium was built as a place of recovery for Eton boys in case of illness. Within 300 yards of the windows of that Sanatorium it was proposed to erect gas-works. He could hardly have believed it unless he had seen it with his own eyes. It was true that some people were so enthusiastic as to believe that gas-works, instead of being a nuisance, were beneficial. He had known a gentleman give evidence before a committee that they were beneficial in this way—that in India soldiers were kept within the boundaries of their barracks by the walls being coated with gas tar, which would soil their white trousers if they attempted to get over the boundary, and that thus they remained free from diseases which prevailed outside. But in time of recovery from illness, perfect purity of air was most essential to convalescence. For all these reasons—the extinction of Lammas rights, the protection of gas consumers, and the gas-works being prejudicial to the residents in the town and school—those who promoted this opposition felt most strongly that they should, at almost any cost if necessary, oppose the passing of this bill. He trusted that in their opposition they would be met in the same spirit of conciliation in which they were met in that room, upon another parliamentary bill, a twelvemonth ago. They met, on the occasion to which he referred, to oppose the Thames Purification Bill, which empowered its promoters to bring all the muck of Windsor through Eton to a dépôt at Farnham Royal; and when the gentlemen in charge of the bill found the strong character of the opposition to it, they at once frankly confessed that they had not had any idea of such an opposition, and withdrew the clause in reference to this locality from the bill.

Mr. W. J. SANDERS had much pleasure in seconding the resolution. His strong objection was to the site that had been selected. If the college authorities had given the subject consideration, they would never have given their assent to the site of the gas-works. The Eton Gas Company was started not so much as a speculation as to meet a public requirement. It was to be hoped that the company would choose some other site, for the college and town decidedly objected to that proposed in the bill. He trusted that, seeing the strong feeling that existed in the place, the gas company would meet the inhabitants in a friendly way, so as not to put either the promoters or the opponents of the bill to unnecessary expense.

Mr. G. H. LONG, solicitor to the Eton Gas Company, explained that as he was not entitled as a non-resident to address a meeting at Eton, he attended in consequence of an intimation received from the Rev. W. B. Marriott on Thursday evening that the meeting would take place. He should not move any amendment, to do which as solicitor to the company he had not been authorized. He understood, at an interview with Mr. Marriott some time

ago, that the new site was unobjectionable, with the exception as to the Lammas rights. [Mr. Long was about to detail what took place at the interview, but Mr Marriott intimated that he had considered the communications that passed as private and privileged, and Mr. Long did not pursue the subject.] With regard to the Sanatorium, the proposed site was 250 yards from that institution, with the Great Western Railway viaduct at the rear of the works, and the gas-works in that position could not be prejudicial to the Sanatorium. The site, moreover, was one near which there were no houses. With regard to the old site, the two gentlemen whose houses were nearest to it found no inconvenience from it. [This statement was received with much laughter, and the Rev. Mr. Marriott explained that it was quite a mistake.] The gas company would be happy if the gas-works could remain where they are, as it would save them, as a company, a considerable sum of money; they would most reluctantly remove, and they proposed to do so only because they must secure a site somewhere. The works required to be enlarged, because the Windsor Gas Company had arranged to withdraw their gas from Eton on March 25th, and it was not anticipated that the Slough Gas Company would lay their mains to Eton. A monopoly had been talked of, but it need not be feared under the parliamentary clauses inserted by Lord Redesdale, the chairman of committees of the House of Lords, in bills for the management of gas companies. These clauses, among other things, limited the rate of interest to be paid to the shareholders; therefore it would not be beneficial to the company to charge a high rate to the consumer, as the shareholders could not receive a commensurate advantage. The directors of the Eton Gas Company would not depart from the manner in which they had hitherto supplied the consumers. When the Cannel Coal Gas Company was formed at Eton its gas at 8s per 1000 cubic feet was preferred to the Windsor gas at 5s. 6d. The price had been reduced to 6s. 6d., and it was not intended to exceed that sum, but rather to reduce it still further if the funds would permit. The 7s. 6d. limit was allowed by Act of Parliament, and that was the sum allowed to the Great Western Company in London, whose consumption was a thousand times more than that of the Eton Gas Company. On three or four other occasions portions of the Lammas land had been taken. [A voice: Only once by Act of Parliament.] Land had been taken for the Great Western viaduct, the Sanatorium, and the church. As to the illuminating power, the Windsor Gas Company proposed a standard of 13 candles, whilst at Eton the lowest standard was 18 candles, and test it when they liked they would never find its standard less than 21 candles. In reply to a question whether there had been any attempt to obtain another site, Mr. Long said the directors had gone round the parish of Eton, and had fixed upon this site as the most unobjectionable.

Mr. STEVENSON supported the resolution. He laid much stress upon the circumstance that the Sanatorium and the Eton Wick Church had been erected upon the Lammas land, and strongly objected to any further encroachment on it.

The Rev. W. B. MARRIOTT, in reply to Mr. Long's observations, stated that at the time of the interview to which he had referred, he had only an imperfect idea of the proposed new site of the gas-works. It was only upon walking out to the site with the Rev. Mr. Durnford that he saw fully the objectionable character of the proposition. The college authorities, occupied in reading from morning to night, had not time to read the official advertisements in the *London Gazette;* they had not time even, he was afraid, to read the advertisements in the *Windsor Express;* and he could state it as a fact that the head master of Eton had not heard one word as to the proposed site until after the conversation of which Mr. Long had spoken.

The resolution was carried almost with unanimity, there being 22 hands held up in its favour, and only 3 against.

Mr. OSCAR BROWNING moved the subjoined resolution:—"That a petition against the bill be presented to Parliament, and that a committee be now appointed to conduct the opposition to the bill, it being understood that they will accede to any amicable settlement of the question at issue which will secure the objects of the petitioners, and save the expense of further opposition in Parliament."

Mr. RUSSELL DAY seconded the resolution.

Mr. LONG supposed that the only amicable arrangement would be the withdrawal of the bill. If that were the real object referred to in the resolution, he would tell the meeting at once that the company could not withdraw the bill—that they were in that position that they must go on with the bill.

A VOICE: Cannot they alter the site?

Mr. LONG: The company had no power to alter the site without the withdrawal of the bill, and could not afford to lose the expense to which they had already been put in their application to Parliament.

The resolution was carried without a dissentient, and the following gentlemen were nominated a committee:—Rev. F. E. Durnford, Rev. John Eyre Yonge, Rev. E. Hale, Rev. C. Wolley, Rev. W. B. Marriott, Mr. Oscar Browning, Mr. E. Warre, Mr. Drake, Mr. Sanders, Mr. J. H. Saunders, Mr. Barton, with power to add to their number.

The Rev. J. E. YONGE remarked that whatever might be the standard illuminating power of the Eton gas, at present it did not exceed, in fact, that of half a dozen candles.

On the motion of the Rev. N. L. SHULDHAM, a vote of thanks to the reverend chairman, which the Rev. Mr. DURNFORD briefly acknowledged, terminated the public proceedings.

The committee met subsequently, and among other business, retained the professional services of Mr. C P. Barrett for the opposition.

CITY OF LONDON GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of this Company was held at their Office, Dorset Street, Salisbury Square, on Wednesday, Feb. 6—ROBERT ALEXANDER GRAY, Esq., in the chair.

The SECRETARY (Mr. Millar) having read the advertisement convening the meeting, the corporate seal of the company was affixed to the register of proprietors. The minutes of the half-yearly meeting held in August were read and confirmed.

The following report and the statements of accounts annexed were then presented:—

Gentlemen,—Your directors much regret having to commence their report by adverting to the mournful fact of which you have been apprised by circular—the death of their esteemed colleague, Mr. Kenneth. From the period of his election Mr. Kenneth devoted his attention with much energy and perseverance to the duties of his office, making himself fully acquainted with the practical working of the company, and had thus become an efficient coadjutor. Your directors, while regretting the loss the concern has sustained, are assured you will unite with them in every expression of sympathy and condolence to his bereaved family.

Your directors have also to report the death of an old and faithful officer of the company, Mr. Ernest Milliken, to whom, in August, 1861, you granted a pension of £130 per annum, by which the comfort of his latter days was greatly enhanced. He died on the 5th of January, at the advanced age of 84.

Your directors refer for a moment to the recent calamities in the coal districts, by which so many families have been bereaved of husbands and fathers, to express their conviction they have only anticipated your views on the subject by having voted the sum of £100 in aid of the fund raised on their behalf.

The ordinary channels of communication will have made you acquainted that the gas agitation still continues, and, as you are no doubt aware, the corporation of the City of London had renewed their notice of last year for a bill to enable them to erect gas-works, &c., thus seeking to constitute themselves manufacturers of gas. This they have now withdrawn, but the Metropolitan Board of Works have taken up the subject, and made a representation to the President of the Board of Trade, obviously founded on the report of the committee of the House of Commons last year. To this report the united companies entered a strong protest before the committee, on the ground of its being based on *ex parte* statements; and that, in the face of this fact, the Board of Works should have issued the document referred to, containing, as it does, suggestions and recommendations of a most extraordinary character, has been the occasion of much surprise to all conversant with the subject.

A complete answer to all allegations set forth in this document has been drawn up, and is now before the President of the Board of Trade; and your directors feel confident the gas companies may rest satisfied Government will not sanction the introduction of any bill the effect of which would be most seriously to affect the very large capital—amounting to several millions—which has been expended with the sanction of Parliament in the erection of gas-works for the benefit of the metropolis. This continued agitation has required, on the part of your directors, in conjunction with the directors of the other metropolitan gas companies, much time and anxious consideration, and as the Board of Trade have given notice of a bill, doubtless some legislation on the subject will take place during the present session of Parliament, which will require much care and attention.

The City analyst has, with few exceptions, reported the company's gas to be in excess of the requirements of the Act of Parliament.

The accounts for the half year are appended hereto, and your directors much regret that the reduction in the price of gas to which they were compelled to submit in the beginning of last year, and to which they referred in their last report, together with the loss sustained by the low price of coke during the half year, necessitates their recommending to you to declare a dividend somewhat reduced from that you have for some time received. The amount at your disposal, subject to the income-tax, is £18,364 0s. 11d., and out of this your directors recommend you to declare a dividend for the half year as follows:—viz., on the A and new shares at the rate of £8 per cent. per annum, and on the B shares at the rate of £4 per cent. per annum, all to be payable free of income-tax.

Your directors close their report by stating that the death of Mr. Kenneth, to which they have referred, having occurred very recently, they decided to adopt the course they pursued on a former occasion, not to avail themselves of the powers of the Companies Consolidation Act to fill up the vacancy for the time being, but to leave the matter in the hands of the meeting.

Two gentlemen, Mr. J. R. Peill and Mr. George S. Caulfield, are candidates for the office; both are eligible, and present themselves to your notice.

R. A. GRAY.

No. 1.—*Statement of Profit and Loss, for the Half Year ending Christmas*, 1866.

Dr.		*Cr.*	
To Cost of coals consumed, including porterage	£26,189 10 7	By Rental	£50,298 12 7
Rents, rates, and taxes	1,754 1 6	Coke	9,738 19 7
Wages	10,340 9 4	Breeze	786 11 3
Directors and auditors fees	654 12 0	Liquor	730 5 0
Salaries	2,555 0 0	Tar	1,877 5 0
Tradesmen's accounts	6,173 11 10	Old materials, &c.	479 7 1
Repair and depreciation of meters	1,466 7 1	Transfer fees	3 5 0
Petty cash disbursements	585 4 10		
Interest	1,796 11 1		
Bad debts, allowances, &c.	338 0 9		
Parliamentary expenses	91 6 7		
Balance	11,899 9 11		
	£63,844 5 6		£63,844 5 6
		Balance of profit brought down	£11,899 9 11

No. 2.—*General Balance-Sheet.*

Dr.			*Cr.*		
To Capital		£394,588 0 0	By Plant		£412,663 15 9
Debenture bonds, with interest to date		61,295 3 6	Leasehold property		4,277 10 1
Contingent-fund		5,360 10 3	Amount due for light	£37,118 7 8	
Mr. Benham's benevolent-fund		1,100 0 0	Ditto coke, &c.	5,786 7 7	
Debts to sundries		29,529 10 3	Ditto sundries	7,406 13 7	
		£491,873 4 0			50,311 8 10
Balance carried down—			Amount of cash on hand	£5,519 11 8	
Brought forward from Midsummer, less income-tax since paid	£ 6,464 11 0		Ditto petty cash	3 13 4	
Half year's profit, per No. 1	11,899 9 11		Ditto bills receivable	326 14 6	
		18,364 0 11			5,849 19 6
			Stock on hand—		
			Coals, &c.	£10,574 14 7	
			Materials	2,413 14 4	
			Meters	24,146 1 10	
					37,134 10 9
		£510,237 4 11			£510,237 4 11
			Balance of profit brought down		£18,364 0 11

J. T. HADLAND AND W. FORTESCUE, *Auditors.*

The CHAIRMAN: Gentlemen, it has been usual at meetings of this company for me to address a few remarks to the proprietors. In doing so on the present occasion I need not say to you that I feel very much concerned that we are not able to give you the same dividend that we did last half-year. You may easily suppose that the agitation which has been carried on for some time has had some effect upon our dividends. I need not remind you that that agitation, which was commenced some time back, still continues, but we trust ere long it will be brought to a conclusion, and that the loss which gas companies have sustained up to the present period will be recouped, in some form or other, when the Government take upon themselves to legislate, and to place gas property in that state of security to which we are entitled, but which we have not enjoyed for a long time past. You are all aware that in the last session of Parliament the question of the supply of gas to the metropolis was fully gone into, when the bill promoted by the corporation of the City of London was introduced. But it unfortunately happened—and I may say it was a matter of the deepest regret and concern to the companies—that the select committee having given an intimation that no evidence would be required on their part, the allegations made on the other side remained unanswered; and this has furnished our opponents with the means of circulating, which they have done very widely, the *ex parte* statements made by their witnesses—statements which, if we had been permitted to call evidence, would have been completely rebutted, and I have no doubt, ere this, the gas companies of the metropolis would have been in a state of comparative prosperity, which, unfortunately, is not the case. The Board of Trade have given an intimation that they mean in the present session to bring in a bill to regulate the supply of gas throughout the whole of the metropolis. What the nature of that bill may be we cannot tell, but I should be very unwilling to believe that a Conservative Government would do anything to damage vested interests. I unhesitatingly say that a gas company is just as much entitled to protection in the conduct of their business as any landed proprietor is entitled to in the possession of his estates; and it would be just as reasonable for the tenant farmers to call upon the Government of the country to fix a maximum price to be paid for the land, as for the consumers of gas to ask that a maximum price should be fixed by law for that article. One would be just as right and reasonable as the other. The companies have been occupied in giving the Government such information as they think will have the effect of putting them in possession of the real facts of the case, and as I hope may induce them to bring forward such a measure as will, I repeat, place our property in a more secure and satisfactory state than it has been for some time past. The depreciation in the value of all gas property has been most frightful. I have before me returns for the years 1863, 1864, 1865, and 1866, and I gather from them the following facts:—In 1863 the shares of the Commercial Gas Company were selling at £48; in 1866 they were down to £34. The City of London Gas Company's shares, which in 1863 were worth £31, are now down to about £27. The Equitable Gas Company's shares, which in 1863 were worth £92, are now worth only £71 in the market. The Chartered Company's shares in 1863 were fetching £87; they are now about £49 or £50. Their new shares, on which £35 has been paid, were selling at a premium of 22 per cent.; they are now down to 2 discount. The Phœnix Gas Company's shares, which were selling at £28 and £29, are now down to £23. The Imperial Company's shares, which were selling at £86, and were considered a safe investment for the money of widows and orphans, have been brought down, through the manner in which that company have been treated by the Bishop of London, to £64 and £66. The Great Central Company's shares, have not fallen in the like proportion, but they are now down to £11 10s. In the midst of the agitation which has been so studiously kept up against us, I most sincerely hope that the press is awakening from that state of apathy it has exhibited for a long time, and is beginning to see that the gas companies of London have been most shamefully treated. I will just read you a paragraph on the subject from a paper which has a very wide circulation—the *Saturday Review*. The editor says: "Unluckily for the gas proprietor's security and peace of mind, gas became a subject of parochial agitation and parliamentary inquiry. One great company was about to extend its works in the neighbourhood of an episcopal palace, and consequently nine bishops, totally ignorant of the merits of the case, and superior to secular considerations of propriety, made their unaccustomed appearance in the House of Lords to defeat the bill. A parliamentary committee of last year, having received detailed evidence from the opponents of the gas companies, after intimating their opinion that an answer was not required, reported against the side which had not been heard. The agitation of two years has reduced the value of the property of the gas companies by at least 2 millions. The Metropolitan Board of Works has lately passed a resolution which would reduce the maximum dividend from 10 to 6 per cent., and confiscate a proportionate amount of the capital invested in the trade. Yet the higher limit has been deliberately fixed by Parliament with full knowledge of all the circumstances, and all calculations have been founded on the implied bargain. One of the numerous disadvantages of joint-stock trading is the risk of interference which attends unavoidable publicity. The great bulk of the community can only participate in commercial profits by holding stock in trading companies, and it is not their interest to diminish the opportunity of convenient and profitable investments by encouraging the popular clamour against incorporated capital." That is the opinion of the *Saturday Review*, and there was a very excellent article in the *Daily News* of Friday last to the same purport. Well, gentlemen, I believe the Metropolitan Board of Works have in a great measure founded the representations they have made to the Board of Trade upon the evidence given by a Mr. Cleminshaw—a person who at one time was the manager of the Manchester Gas-Works. He stated in his evidence before the select committee of the House of Commons last session that, notwithstanding the comparative difference in the price of Wigan coal in London and Manchester—that being the coal which, if we were required to supply 22-candle gas to our consumers, we must almost exclusively use—gas so made ought to be sold here at 3s. per 1000 cubic feet, and that it could be sold at that rate to pay the proprietors a dividend of 10 per cent. Now, the difference in price of Wigan cannel at the present time is this—in Manchester it is being sold at 15s. per ton, whereas in London it is 27s.; therefore, how Mr. Cleminshaw could arrive at the conclusion he has done I am at a loss to know. But still it suited the purpose of the Metropolitan Board of Works to quote his evidence, and I believe their report is in a great measure founded upon it. I think it is a very great question whether a body constituted as the Metropolitan Board of Works are can be regarded as possessing that amount of knowledge which they seem to think they have, that they may be safely entrusted to legislate upon every subject. I suppose by-and-by they will modestly assume that they could undertake the management of the Channel fleet. It would have been far more becoming in Sir John Thwaites, when consulted by the Government upon the gas supply of the metropolis, to answer that the question required a great deal of consideration; that the evidence before the board was not of that satisfactory nature that would enable them to give any advice to the Government; and that they must seek information in some other quarter. If the Metropolitan Board had taken that course they would have acted very wisely; taking the course they have done will, I think, place them in a very unenviable position as a public body. Gentlemen, I have now, perhaps, said almost as much as I ought to say. I hope the next time we meet we shall meet under more happy auspices; that we shall then have our interests well protected; and that those who have done us so much injustice will be ready to acknowledge their error, and do all in their power to repair the injury they have inflicted. It is a somewhat singular coincidence that a few days ago the Bishop of London wrote to me to assist in establishing a penitentiary. I thought I might perhaps reply that if his lordship would permit me to aid him in the establishment of a penitentiary to receive more distinguished delinquents than those he then contemplated, I should be happy to subscribe to it. I think I should be justified in doing so, and in telling him I am a friend to all penitentiaries; but there is a wide difference between the penitentiary he contemplates and the one I speak of. The former would be for those people who of necessity have committed crime; whereas the latter would be for those who had inflicted grievous injury upon others, without any provocation whatever. That is just the distinction, and therefore the measure of punishment in each would be varied in the like proportion. But if the bishop, and those associated with him in their act of injustice, will compensate the gas companies for the losses they have sustained, we will forgive them, and say no more about it; I am afraid, however, there is no prospect of their doing so. I think if the six or nine bishops were to clothe themselves in sackcloth and ashes for the remainder of their lives, they would only feebly express the repentance they should feel for the wrong they have perpetrated. For, notwithstanding they were warned by the Lord Chancellor, and Lord Redesdale, and several other peers, that the course they were taking was a most unusual one, they persevered in their wrong doing, and the bill was thrown out on the second reading. The Bishop of London was successful also on a former occasion, and got the bill of the Imperial Company thrown out on precisely the same grounds, and thus inflicted upon them a deep loss, from which they are now suffering. Gentlemen, I have now only to apologize for having trespassed so long upon your time, and will just add that I shall be happy to answer any questions you may desire to ask. I conclude by moving—"That the half-yearly report of the directors now read be received and adopted."

Mr. BRUSHFIELD: I beg leave to second the proposition which our chairman has made, and I must say that I do not wonder at all at his having shown a little indignation at the position the gas companies are in at the present moment, and that he should have referred as he has done to the bishops, though, perhaps, he has been a little hard upon them, for, I think, if any persons deserved to have a place in a penitentiary, they are those who have so recklessly interfered with the business of the gas companies. At the present time the companies are in a most unfortunate position; they really seem to be beset on all sides by persons anxious to do them a great injustice. With reference to the Metropolitan Board of Works, I happen to be a member of that board, and was present during the discussion of this question. I found at the time that the speakers had taken all the information they had from the Blue-Book to which the chairman has referred, and knowing, as I did, how unjust and unfair that Blue-Book was, I conjured the board not to give an answer to the Government till they were better acquainted with the subject. I begged them to put Sir John Thwaites, as it were, in the chair—and a better witness could not be placed before a committee of the House of Commons—and consider what questions would be asked of him. "You can do certain things?"—"Yes." "Can you show us how they will be done?"—"Yes; it is in the Blue-Book." As I told them, they might just as well read "Robinson Crusoe" for their information. And really it is so; for that Blue-Book is the most unfair representation of the facts of the case that could possibly be made. Well, sir, we cannot help ourselves just now, but I assure you I have very great faith in what I may call the reaction which has taken place, and which is now going on. It is scarcely two years since the agitation was rife in the City of London, when every person who presented himself as a candidate for the Common Council was challenged as to his opinion on the gas question. Gas was the leading principle, and was made the test of qualification for office then, and upon the opinion held respecting it depended the candidate's election or non-election. Then the corporation promoted a bill in Parliament, and the result was the Blue-Book to which you have referred. It is a strange thing, but if you look at the history of these proceedings you will find that at the time the agitation commenced in the City a Lord Mayor was presiding over the corporation who was a tallow-chandler. There is the same feeling in the minds of tallow-chandlers at the present day against gas that there ever was. A meeting was called by him in common hall to discuss this question, and from that moment to the present the agitation has been going on. But, sir, I think there are some bright prospects for us. I think I see something of the silver lining of the cloud in the fact that on last St. Thomas's Day there was no Juggernaut of that sort—the day passed over and nothing was said about gas. The fact is, that every high-minded man in the City or elsewhere who looks at the report in the Blue-Book must feel ashamed of the whole case. Indeed, I think the palpable unfairness of the whole affair is, perhaps, the best thing that could have happened to us. Whatever may be the opinion of the man who reads that book, as to the necessity of legislation on the subject of the gas supply of the metropolis, he must feel that there is a great injustice in taking that as the basis and support of any arguments against the gas companies. I do not know whether you have seen a pamphlet just published by Mr. Cleminshaw; if you have, I am sure you can see at once the *animus* of these people. They will persist, without rhyme or reason, in discussing this question as though every one connected with the gas companies was dishonest. When the subject was before the Metropolitan Board, I put it to them that, supposing their proposition to the Government were true, and that 18-candle gas could be supplied at a maximum of 3s. 6d. per 1000 feet, they ought to show that the price of cannel coal, of which at least 60 per cent. must be used to make such gas, would never be any higher than it is at the present time. I recollect, some years ago, when we were very anxious to make gas cheap, we had a proposition submitted to us by some one who said he would undertake to make it much cheaper than we could ever do. His plan was to dispense with coals altogether, and make gas of bones; but he seemed to forget that if he could succeed in making gas in that way, the price of bones would immediately go up to five times their former price, so that his calculations, based upon the cost at the time of his proposition, would be altogether thrown out. And that is just what would happen in the case of cannel coal. But what does Mr. Cleminshaw say? "They (the gas companies) will, of course, attempt to shield themselves

from any such imputation by pointing out the deficiency in the supply of suitable coal; but with a larger demand a better and sufficient supply is sure to follow. Men of business do not usually invest their capital to supply material of any kind before it is wanted, but rather wait to see the probability of the demand for it, and then take their measures accordingly." Now, I maintain that the assertion of a supply following the demand, in this case, is perfect nonsense; we know that it cannot do so, because the supply itself is extremely limited, and therefore all the arguments based on this assumption fall to the ground. And then, hear what he says again: "No one will deny that the gas companies have not used the best coal, and that they have consistently endeavoured to keep the quality of their gas at the lowest possible standard. It is likewise the fact that, so far from the illuminating power of their gas being improved by a better system of manufacture, it has actually been deteriorating. The endeavour to lessen the cost to themselves has reduced its illuminating power, and consequently its value to the consumer, and this to a greater extent than they allow they themselves have gained." And he says that all this has been done by the London gas companies to secure themselves a dividend. Now, if I know anything about making gas, and the anxiety of the directors of gas companies—taking our own company, the Commercial, as a sample—I say there is not a single suggestion or device that comes to their knowledge but what is honestly tried, and if practicable adopted, with the view of producing the best and the cheapest article they can obtain. There is another gross slander which has been uttered against the companies. It is said that having the Act of 1860 in their hands, which gives them the power to create a reserve-fund to the extent of 10 per cent. of their capital, they are determined, before reducing the price of gas, to make that reserve so as to guarantee them their 10 per cent. dividend. Why, sir, this is a great misstatement. The fact that this day the City Gas Company are only about to pay an 8 per cent. dividend—which, by the way, I am extremely sorry for—is a complete answer to such an allegation. Why have you done that? Is it because you are laying by a reserve-fund to meet deficiencies in future dividends? Nothing of the sort; it is because you have reduced the price of gas to the public 6d. per 1000 feet, and you have done that without reference to the creation of a reserve-fund at all. Well, sir, as I said, I do believe, for the honour of the City of London, that the agitation is dying out there. I think they are perfectly ashamed of it. They must have read that Blue-Book with tears in their eyes; and I am sure that, if there is anything in the world they ought to be ashamed of, it is this. I hope and believe there are better times before us. With respect to the Board of Works, I think they were not so unanimous on the subject as they appeared to be, although, from the report of their proceedings, you would see that I stood alone, and could not get a seconder for my amendment. But as I told them then I tell you now, that it has been sometimes the greatest pleasure of my life to stand alone, when I know that I have right and truth on my side. For my part I do not see why, if the Metropolitan Board are to take the manufacture of gas into their hands, they might not as well take up with any other trade—say match-making, or any other manufacture for which there is a large demand. At the present time they are engaged in settling the claims for property along the lines of several new streets, but, in dealing with the owners of that property, they act upon quite a different principle to that adopted with the gas companies. The inquiry always is, "What is your profit?" and they compensate accordingly. But here they would lose sight entirely of the rights to which we are entitled under our Acts of Parliament. I hope, however, a better state of things will be brought about, and that things will be put upon a right basis. If I thought that the gas companies had not kept faith with the public—if it could be shown to me that they had violated the provisions of the Act of 1860—I should say by all means let them suffer; but, believing as I do that they have conducted their affairs in accordance with the letter and in the very spirit of the Act—I speak confidently for my own company, and I am sure I may speak for the City Gas Company also—I consider that they have as much right to be protected under that Act of Parliament, as the persons who hold land under Lord Derby, or any one else. An Act of the Imperial Legislature ought never to be passed which does not give perfect security to those who are affected by it. At the present time I am trustee for persons who, in two or three cases, are entirely dependent upon their investments in gas property. But if the proposition of the Board of Works were carried out, they would not get a shilling return for their capital, and therefore I say the injustice of the proposal needs only to be brought before honest men, and there is no doubt whatever about the result. I have very great pleasure in seconding the motion. I wish you could pay us 10 per cent. instead of 8; but I would rather have 8 per cent. when I know that you are conceding something to the public. We ought always to consider the public, and I have no doubt you have the desire to do so as well as the directors of the company to which I belong. We are told continually that the gas companies do everything to promote their own interests, and nothing for the public. I say that is a slander. You lowered your price to meet the consumers; we did the same, without any reference to the provision in the Act of Parliament which authorized us to lay by a 10 per cent. reserve. I wish it to be understood by the world that we are doing no injustice to the consumers, but that we ever have endeavoured to supply them with gas at the lowest possible price. The Act of Parliament provides—and whatever amendment is made in it I presume some such provision will still exist—that when our profits enable us to pay a certain dividend we must reduce the price of gas to the public. But these people who are continually agitating for cheap gas are putting us from time to time to enormous expense. Where will it come from? It must come out of the pockets of the consumers, because it all goes to keep down the profits of the gas companies, and thus postpone the time when further reductions of price would be possible.

Mr. WARD: Will you allow me to ask Mr. Brushfield, as a member of the Metropolitan Board, whether I rightly understand that if that board take the management of the gas supply of London into their own hands, they do not propose to be restricted to a 3s. 6d. maximum and an 18-candle standard?

Mr. BRUSHFIELD: That is a question which I have myself put, and could not get answered. One of their propositions is to take the works, and pay the existing shareholders in the gas companies 6 per cent, which would really amount to a confiscation of their property. The other proposition is to place the companies under such restrictions as to price and quality, that they would really never get a shilling dividend.

The CHAIRMAN: The speech of my worthy friend is entirely in harmony with my own views. He expresses the hope that there will be some good come to us in the future, and so I believe. We have had to encounter a great deal of abuse, but a man need not be afraid of abuse when he acts uprightly. Our object and desire has been to consult the public on all occasions, but there is a duty which we owe to our proprietors as well as to the public, and that duty is not to make concessions which would involve their property in inextricable difficulty. A report is now before the Board of Trade, signed by several of our engineers, who have gone minutely into the question of the cost of making gas of 20 candle illuminating power. It is clearly proved by that report that to make such gas would require from 60 to 70 per cent. of cannel. Now the quantity of cannel coal is very limited, and in proportion as the demand for it increases, the price will rise. But, taking it as it now stands, there would be a clear loss to the London companies of £462,711 a year—no dividend whatever, but an absolute loss to that extent—if they were required to carry out the proposition of the Metropolitan Board of Works.

A PROPRIETOR: Allow me to ask what balance you will have in hand after paying the dividend mentioned in the report.

The CHAIRMAN: About £5000, and then we have a contingent-fund of about the same amount.

The motion was then put, and carried unanimously.

Mr. BRUSHFIELD moved the following resolution—"That, agreeably to the recommendations contained in this day's report of the board of directors, a dividend out of the profits of the concern for the half year ending at Christmas last, be now declared as under:—On the A and new shares at the rate of £8 per cent. per annum, and on the B shares at the rate of £4 per cent. per annum; the whole to be payable, free of income-tax, at the company's office, on the first Tuesday in April next, and on each succeeding Friday and Tuesday, between the hours of twelve and one o'clock."

Mr. WHITE seconded the motion, which was put, and carried unanimously.

The CHAIRMAN: The next matter to which I have to call your attention is the vacancy at the board, caused by the lamented death of Mr. Kenneth In the introductory part of our report the directors alluded very properly to the loss they had sustained by the sudden death of that gentleman. I have no hesitation in saying that we never had a colleague with whom we associated with greater comfort and satisfaction than Mr. Kenneth. We deeply lament his loss, as far as the company are concerned, and we sympathize most sincerely with his family in their sad bereavement. It is now our duty to supply the vacancy in the direction. We have done on this as on former occasions—the meeting of proprietors being so near at hand, we have not, as we might have done under our Act of Parliament, filled up the vacancy. We feel it is always better, where it can be done without inconvenience, to leave the election with the proprietors. There are two candidates for the seat—Mr. Peill and Mr. Caulfield—and it will be now for the meeting to choose between the two.

Mr. CAULFIELD: Will you allow me to say, in order to save time, that having consulted with my friends, and having learnt that Mr. Peill is well known to our deputy-chairman, who is anxious he should have a seat at the board, I beg leave to withdraw my name. I have met with very cordial support from the proprietors, and should have endeavoured to do my duty to the best of my ability had I been elected to the office; but I believe I am best consulting the interests of the company by taking the step I am now doing. I thank the proprietors who have favoured me with their support, and when a vacancy occurs in the board at some future time I shall be happy to place my services at the disposal of the company.

Mr. HADLAND (deputy-chairman): I thank Mr. Caulfield for the handsome manner in which he has withdrawn on this occasion, and thus saved us the trouble of an election. My friend, Mr. Peill, is so specially qualified for a seat at our board, particularly under the circumstances in which we are now placed, that I feel personally obliged to Mr. Caulfield for retiring in his favour. I beg to propose that Mr. Peill be elected a director of the company.

Mr. LEWIS seconded the motion, which was put, and carried unanimously.

Mr. PEILL: As the successful candidate on this occasion—successful through the graceful manner in which Mr. Caulfield has retired—I beg to thank you most sincerely for the honour you have done me in placing me in the position I now hold. I can assure you I should never have had the presumption to offer myself to your notice had I not been assured by gentlemen well qualified to form an opinion that I should be a suitable person for the post. I have been an active man of business; I am now a man of leisure. I have had special opportunities of informing myself on those subjects which are likely to be brought before me in the position I am now to occupy. Under those circumstances I had no hesitation in coming forward to offer myself for your acceptance. I feel that I am not likely to fall into a luxurious idleness here as I might do in some directorships; but, on the contrary, that, connected as I shall be with gentlemen of such ability and energy, it will be as much as ever I can do to occupy my position in a proper and becoming manner, so as to meet with your satisfaction. Nevertheless, as far as my abilities go, it will be my greatest pleasure and pride to imitate, though at a humble distance, those high qualities which we all give credit for to the chairman and the other members of the board, so that when we compare notes, as we shall have to do, on some future occasion, I shall hope not to be found wanting in the performance of those duties which you have now kindly and generously placed upon me.

Mr. WHITE: I see, in the JOURNAL OF GAS LIGHTING, that the Chartered Company are about to apply to Parliament for another bill, and that provision is made in that bill that this company may subscribe for £150,000 of the additional capital asked for, but that we are not to have any vote except in some very peculiar way. Perhaps the directors will give us some explanation on the subject.

Mr. WARD: The Chartered Company are going to Parliament, and they offered to us the privilege of making a subscription to their works, in order that they might be an auxiliary to our own. But of course the subscription is not compulsory upon us, it is only permissive; and we ourselves have taken special objection on the very point to which the attention of the meeting is called. The answer we received was, that these clauses are not settled, and will be altered in committee.

Mr. LEWIS moved, and Mr. PERRY seconded the following resolution, which was cordially adopted:—"That the best thanks of the proprietors are due, and are hereby presented to the board of directors for their undiminished attention to the interests of the company."

The CHAIRMAN and DIRECTORS severally acknowledged the vote. The chairman said he thought, before the meeting separated, he ought to inform the proprietors that Mr. Barlow had taken up the cause of the London gas companies with a great deal of ability and energy in the pages of the JOURNAL OF GAS LIGHTING. The last number of the JOURNAL contained an excellent article on the subject, in which the report of the committee of engineers to the Board of Trade was embodied, the perusal of which showed clearly the grounds upon which the conclusions were arrived at in respect of the propositions of the Metropolitan Board of Works.

Mr. H. WALMISLEY moved—"That the thanks of the meeting be presented to the auditors for their services during the last half year."

Mr. PEILL seconded the motion, which was put, and carried unanimously.

Mr. J. T. HADLAND acknowledged the vote.

Mr. BRUSHFIELD moved a vote of thanks to the secretary and other officers of the company for their zeal and attention to their respective duties. He said he believed there was no company in London better served by their officers than the City Gas Company, and he felt that, on occasions like this, the proprietors should embrace the opportunity of testifying their cordial appreciation of the labours of those who contributed so largely to the success of their undertaking.

Mr. HADLAND (deputy-chairman) seconded the motion.

The CHAIRMAN, in putting the question, said there was no person for whom he entertained a greater regard than for Mr. Millar, and he cordially concurred in the remark of Mr. Brushfield, that the company were highly favoured in having a staff of good and efficient officers. They had performed their duties very zealously, and deserved the expression of the approval of the proprietors.

The motion was put, and carried unanimously.

Mr. MILLAR, in acknowledging the vote, said the present was a very remarkable year in the history of the City Gas Company. It was its jubilee year—a fact which had not been noticed by any of the gentlemen who had spoken. The first Act of the company was passed in 1817, and, looking back upon the 50 years of the history of the company, he thought there was not much to mourn over, although there had been a few seasons of depression and times when matters were not so pleasant as they could desire. For the officers of the company, he could answer that they would have been much gratified if the proprietors could this day have received their usual dividend. Of one thing he was perfectly satisfied, that, as had been remarked by an honourable proprietor, it was far more satisfactory to receive the reduced dividend than one cooked up for the sake of popularity. He thanked the proprietors on behalf of himself and the officers generally for the expression of their approval, and trusted that ere long the company would attain and for many years enjoy a large share of prosperity.

READING TOWN COUNCIL AND LOCAL BOARD.

THE LIGHTING OF THE TOWN.

At a Quarterly Meeting of the Reading Town Council and Local Board—the MAYOR (H. J. Simonds, Esq.) in the chair—the following report of the Public Lamps Committee was read:—

Bills and Accounts.—The committee beg to report that they have examined the quarterly account of Messrs. King and Co., for lighting, extinguishing, cleaning, and repairing the public lamps, and various other bills for new lamp-heads and lamp-irons, for removal and alterations of lamps, and for adjusting the public lamps and taking the registrations of the meter-lamps, and for general superintendence of the lamps and meters up to the 31st of December last; and the committee have referred such of the bills and accounts submitted to them as they have approved to the Finance Committee for payment.

The Gas Company's Account and Supply of Gas to Public Lamps.—The committee have also examined the half-yearly account of the Reading Gas Company, for supply of gas to the public lamps, as submitted to them, amounting to the sum of £582 0s. 3d., which is an advance of more than £100 upon the account for the previous half year. The committee are unable to recommend the payment of this account in its present state, as they are of opinion that there are several matters connected with the supply of gas to the public lamps which ought to receive a consideration by the board. It appears that, during the past half year, a considerable increase in the pressure of the company's mains has from time to time taken place, thus disarranging the basis on which the public lamps had been carefully adjusted, and causing an increased quantity of gas at times to pass through all the lamps. There is good reason for believing that the quality and illuminating power of the gas has not been satisfactory. The existing Act of Parliament requires that "all the gas supplied by the company" shall be of such quality as to produce from the authorized burner a light equal to 12 sperm candles; and also to be of a certain standard of purity. It is well known that the minimum standard of illuminating power thus stated is very low as compared with the standard existing in properly lighted towns, and also that, to secure at all times this minimum, an actual standard of not less than 14 sperm candles should be observed by the company. The experiments made by Mr. Hart, however, for some months, show not only at times an illuminating power even less than 12 sperm candles, but that the higher standard necessary for maintaining at all times even that minimum had not been observed by the company; and, although no authorized testing of the purity of the gas has taken place under legal authority, there are circumstances which render it very doubtful to the committee whether the required purity in the gas has existed.

The observations above made would appear to explain the result which has followed—viz., that, whilst the public lamps were carefully adjusted so as to secure a limit of an average consumption of 3¼ cubic feet of gas per hour per lamp, yet the consumption has been gradually increasing until it recently amounted to 4 feet per hour—the fact being clear that an average consumption of 3¼ feet per lamp is ample if the illuminating power of the gas be maintained at a satisfactory standard. The committee also deem it right to call the attention of the board to the circumstance that, whilst the company have charged the board for gas at the maximum of 3s. 7d. per 1000 feet, limited by the company's Act, they have made a reduction on the maximum price fixed by this Act for the charges to other consumers. The Act of Parliament having fixed a graduated scale for the price of gas to be charged to the various classes of consumers, the committee are clearly of opinion that all classes are entitled to a *pro ratâ* reduction in price, and that it is a violation of the plain meaning of the company's Act to vary the charges for the supply of gas upon any other basis. The committee having now explained the various points which have come under their notice, now submit them to the consideration of this board.

The MAYOR said he regretted very much to have had to advise such a report as that to have been read, but, after what had occurred, the committee felt they would be wanting in their duty if they did not bring the subject before the board. The increase in the gas bill amounted to over £200 per annum—and that was a serious consideration—through the pressure having been increased from 3½ to 4 cubic feet per hour. In regard to the purity of the gas, they could see for themselves whether or not it was satisfactory as they walked through the town of an evening. The company said the illuminating power they supplied was 12·90, and that they were only required to produce 12 candles; but what in reality it was necessary for them to do was to see that the power should not fall below 12 candles, for the lowest mean average which was allowed was 14 candles, but the company had only averaged 12·90, and once it had fallen under 10 candles. Then, again, the company had reduced the price of gas to the general consumers, but they had been told that the price of gas to the board would be the same. That, he maintained, was unfair, and he could only see one way of getting out of the difficulty, and that was, to have a contract with the company to charge so much per lamp. There should be a condition stipulating for a certain average purity, and say, perhaps, 50s. per lamp should be charged. If they allowed this increased price to be placed upon them, what guarantee would they have that hereafter the pressure would not increase to 4½ or 4½ cubic feet? They now had a very large number of lamps, and this was a question of importance to them.

Mr. A. SIMONDS said, when they began to use the meters, the arrangement entered into with the company was a provisional one, in order to enable them to obtain some satisfactory data on which a future contract could be based. If they now allowed their consumption to be forced up from 3½ to 4 or 4½ cubic feet per hour, when they came to have a fixed charge for each lamp the calculation would be made upon the highest consumption, and that would make a material difference in their expenditure.

Mr. SPOKES said he could corroborate, from his own private experience, what had been stated about the gas. His own consumption, with the same number of burners used for the same length of time as nearly as possible as formerly, was something like 15 per cent. more than the corresponding period last year. He was not alone in this respect, for he had heard several persons speak of it.

Mr. HURLEY: It is the case all over the town.

The MAYOR remarked that he did not know whether the quality did not increase the consumption.

Mr. SPOKES: It is of very inferior quality.

Mr. MONCK proposed—"That the matter be referred to the Public Lights and Gas Committee to make such arrangements as they may think desirable, with a view to the settlement of the company's account, and to negotiate with them as to the future lighting of the public lights by the payment of a fixed sum per lamp."

The MAYOR said that the increased pressure from 3½ to 4 feet per hour had only been in existence for three months. The change was very gradual, little and little at a time, until it got up to 4 feet.

Mr. BLANDY said he did not stand up as the representative of the gas company, and he regretted that the chairman of the company was not present, as he would have explained better than he (Mr. Blandy) could. He, however, was quite sure the company would be willing to meet, with all deference, any communication that board might think proper to make to them, and give it due consideration. As far as regarded the extra pressure, he did not think any of them would say, let the requirements of the private consumers be what they would, that the company had no right to increase the pressure. If it was intended to imply that, by having additional pressure, the company wished to force more gas through the public lamps, he would deny such an imputation most emphatically. It was true that the company had been compelled to increase the pressure for private consumers, but they had not done it surreptitiously, for there was a fortnightly inspection of the gas, and the increased pressure was perfectly palpable. If it was not required for the public lamps to have as much light, they should be turned down to burn as much as was deemed necessary. The remedy was in their own hands, and he did not think complaints should be directed against the company.

Mr. MORRIS thought the resolution of Mr. Monck would meet the difficulty, and he would therefore second it.

The MAYOR asked Mr. Blandy if it had occurred to him that, if his suggestion were carried out, it would necessitate their servant going round to attend to all the lamps.

Mr. A. SIMONDS remarked that, if the lamps were regulated, they had the power at the works to upset the arrangement, and then their servant would have to go round to all of them again.

Mr. BLANDY: Then, in your remarks you imply that there is gross dishonesty on the part of the gas company.

Mr. A. SIMONDS: I never implied anything of the sort.

Mr. BLANDY: I am very glad to hear you say so. I certainly understood you meant to do so.

The MAYOR: We do not say anything against the company, but we point out this singular accident of the increased pressure and the increased expenditure.

The TOWN-CLERK said the lamps were adjusted in October, and immediately after the pressure was increased.

Mr. ANDREWES said there was no doubt that Mr. Blandy had stated what was true—that the gas company never attempted to force a larger quantity of gas through the public lights in order to raise the consumption of gas. The committee had examined the accounts for gas, but had made no charge against the company. What they said was, that, taking the last three months of last year, and comparing them with the same period in 1865, they found a larger pressure put upon the mains than there was previously. It might be perfectly true that the requirements of the consumers necessitated a greater pressure, and he doubted not that would arise in consequence of the deteriorated quality of the gas. That would really seem to be the case, for if they turned on the gas more than formerly they did not get a better light, and had the extra consumption of 25 per cent. If the gas company was not in a position to reduce the price of gas more than 3d. per 1000 feet to their private consumers, and not make any reduction in the public lights, he questioned whether they were justified in doing so, because the reduction ought to be equally distributed over all the consumers, whether public or private; and it was unfair to that board not to have any reduction made, while the price was reduced to the private consumers.

Mr. HOUNSLOW would like to know why the private consumers paid 25 per cent. more for their gas than did the Board of Health.

The TOWN-CLERK said that was regulated by Act of Parliament, by which it was laid down that a variation should be made in the charge for the public lights and that of private consumers. The scale was well considered, and it must be presumed to be just; if it were not so, the Act ought to be repealed.

Mr. HURLEY thought the best plan that could be adopted was to pay a fixed sum for each lamp.

Mr. CHURCH was quite sure that, if Mr. Monck's motion were passed and submitted to the directors of the gas company, they would deal with it in a fair and liberal manner.

Mr. BLANDY said the quality of the gas had been superior to what it ever had been before.

The MAYOR: Because previously it was beneath contempt.

Mr. BLANDY: The reason I mention that is, because every member who has spoken upon the subject has stated that it was of the worst quality.

Mr. SPOKES proposed that the report of the Public Lights Committee be received and entered on the minutes.

Mr. HURLEY seconded the proposition, which was carried.

The MAYOR then put Mr. Monck's resolution, which was also agreed to.

The company have published the following reply to the report of the Lamp Committee:—

The directors of the Reading Gas Company have had their attention called to a report of the Public Lamps Committee to the Local Board of Health, as contained in the local newspapers of the 9th of February inst., to which, although reluctantly, they feel compelled to reply.

The report states—"It appears that, during the past half year, a considerable increase in the pressure of the company's mains has, from time to time, taken place, thus disarranging the basis on which the public lamps had been carefully adjusted, and causing an increased quantity of gas at times to pass through all the lamps."

By the 93rd section of the Reading Gas Act, 1862, the company is bound at all times to keep their main-pipes fully charged with gas, at a sufficient pressure. The pressure, instead of being increased from time to time, was increased but once in the half year, viz., in the early part of November, the alteration being then neces-

sary to supply the quantity of gas required for winter consumptiom. An hourly and daily registration of the pressure is taken at the secretary's office, to which the officer of the Board of Health has access at all times—an inspection of the pressure sheets will fully bear out the truth of the foregoing statement. The pressure maintained has been the lowest sufficient to supply the wants of the consumers—it being to the interest of gas companies to maintain a low instead of a high pressure, the result of a high pressure being a loss to the company in increased waste by leakage, &c. The management of the public lamps is in the hands of the officer of the local board, who inspects them and takes the registration of the meters regularly once a fortnight, and who has it entirely in his power to increase or reduce the flames of the lamps as he may find necessary.

The report also states that "there is good reason for believing that the quality and illuminating power of the gas have not been satisfactary;" and that "there are circumstances which render it very doubtful to the committee whether the required purity in the gas has existed."

With respect to the illuminating power of the gas, the local board would have found, if they had tested it, as the company's officers do daily, that the average maintained has been considerably above the standard required by the Act.

The apparatus employed by the company for the purification of the gas is of the most approved and best known kind; the greatest care is exercised over this department of the works, and the directors are fully satisfied that this imputation is unfounded.

The directors have taken the earliest opportunity of voluntarily reducing the price of gas to private consumers, but the reduction could not have been so great if a *pro ratâ* reduction had at the same time been made for public lamps. It is the principle in gas legislation that public lamps should be supplied at the same rate as the largest private consumers. The great difference in the price of gas supplied to the public lamps as compared with the rate to private consumers inserted in the company's Act was conceded to avoid expensive parliamentary opposition.

The directors would only add further, in explanation of the remarks made in the report and in the discussion which followed, that the increase in the bill is fully accounted for by the large addition to the number of lamps supplied during the past half year, and by the increased consumption per lamp per hour consequent on the palpably better light they now give than formerly.

By order of the board of directors of the Reading Gas Company,

Feb. 15, 1867. ROBT. BRADLEY, jun., Sec.

ON A CONSTANT WATER SUPPLY FOR LONDON.

By J. F. BATEMAN, ESQ., C.E., F.R.S.

[Read at a Meeting of the Social Science Association, Monday, Jan. 21.]

The question of "constant water supply" is one which has been agitated, not only recently, but on many previous occasions in London, and in those places where the opposite system of "intermittent supply" has been the mode usually adopted. I have been requested to read a paper upon the subject; but as my experience lies almost wholly with the system of "constant supply," I can do little more than state how far it has been successful, and what are its results in the cities and towns with which I am acquainted, and describe what are the difficulties with which a town has to contend when the supply is changed from the "intermittent" to the "constant" system. Coming before you as a comparative stranger, known only by name, but probably presumed to have a certain amount of professional knowledge upon the subject, it may be expedient that I should state to you what my experience is, that you may be able to judge of the value to be placed on the observations I may make.

I first constructed works for the supply of water to towns nearly 30 years ago, since which time I have constructed, in whole or in part, the water-works of some 25 or 26 different towns and cities, varying in size from 7000 to 600,000 persons, and containing a gross population of upwards of 2,000,000. I have, besides constructing these works, been consulted, in one way or another, upon a great number of the water-works of the country which have been in the charge of other engineers during the period named, and I therefore ought to know something of the subject, unless I have made very bad use of my opportunities.

My experience commenced in the manufacturing districts of the north of England, and at the time of its commencement, 25 or 30 years ago, the question of water supply was in a very crude condition. The system commonly adopted, however, even then in that part of the country, was that of "constant supply;" and in my early experience I neither thought of nor knew anything of any other system. In all the towns that I have supplied, there are, I believe, but three which, at the present time, give an intermittent supply of water, and these are towns in which water-works existed before I had anything to do with them. In one of these, the town of Belfast, the system will be discontinued as soon as new works, now constructing, have been completed. In many places, and most importantly those of Manchester and Glasgow, I have been instrumental in changing the mode of supply from the intermittent to the constant system; and it is my experience specially with reference to these cities, and the change of systems, that I shall endeavour to lay before you.

The question of constant supply is one which most materially affects the comfort and the convenience of the poorer classes and the inhabitants of smaller houses. In larger houses ample cistern space is generally provided to secure the equivalent of a constant supply; but where water is constantly laid on from the street mains, there is scarcely any occasion for house cisterns, except for the supply of water-closets. By proper arrangement, little or no inconvenience is experienced from the occasional shutting off of water for the changing or attaching of house services. The first cost of introducing the water to the house is reduced to the lowest possible point, and the pollution, which more or less commonly attends the storeage of water in house cisterns, is entirely prevented; the water is delivered in the purest, freshest, and coolest condition, and very much of the annoyance and inconvenience arising from frozen cisterns and burst pipes, which are the common attendants of the winter season, is avoided. There is no occasion for exposed pipes in out-of-the-way places, for cisterns in roofs or the tops of the houses tobe filled with soot and dust in summer, and to be frozen in winter; and a man may live in tolerable comfort without the dread of the water bursting above his head, and deluging the apartment in which he resides. But the advantage of constant supply to the consumer has been so often and so clearly demonstrated, that it is useless to dwell further on this branch of the subject. The question of its adoption does not entirely rest with the consumers, but with those who have to provide the water. It is believed by many that the consumption under the constant supply is so great that no company or water-works can meet the demand; it would be ruin to them if they attempted it. I cannot but think that all this is a delusion; it is not that more water is actually consumed for the use of the individual under the one system than under the other; but that the amount of *waste* which results from bad pipes and bad fittings constantly supplied with water, is so great as to occasion serious loss and inconvenience to a water company, and, perhaps, in some cases to exhaust their supplies. The experience of those towns where the supply has always been on the "constant system," and where every precaution has been taken for the purpose of securing good workmanship, the best and strongest materials, and the most improved apparatus, the consumption of water per head is certainly not more, probably less, than it is in towns similarly circumstanced in all other respects, but supplied with water on the intermittent system. This is abundantly proved by the statistics of water supply in such places. For instance, the average consumption of water in the manufacturing towns of Lancashire and Yorkshire is from 16 to 20 or 21 gallons per head per day for all purposes, including trade, and, of course, all the waste which may be taking place. In Manchester, the quantity consumed by about 600,000 persons, and by the trades demanding water within the district supplied, varies from 12 to 13 million gallons per day. Of this quantity it is estimated that one-third is supplied to manufacturers, leaving the net quantity consumed for domestic purposes, including waste, 14 gallons per head per day.

The experience of Preston, Blackburn, Bolton, Stockport, Halifax, Warrington, and all the other manufacturing towns in the north of England, is identical with that of Manchester; and if this be compared with the consumption which obtains in towns supplied under the intermittent system, it will be found that scarcely in any case does the supply fall to so low a point as under the constant system.

In London it is 32 gallons per head per day, and in Plymouth, Devonport, Shrewsbury, Oxford, and other places supplied on the intermittent system, the consumption amounts to 30 gallons or more per day.

The quantity required in different towns no doubt varies according to the class of inhabitants, the circumstances, and the habits of the people; and it is universally found that where water-closets exist as a general rule, the consumption is greater than where they are comparatively absent.

It may be well, therefore, to adduce a few examples of what is actually required for domestic use.

We have shown that in the manufacturing towns, with an unlimited and unstinted supply, 14 gallons per head per day are all that is taken for domestic use. In Preston, careful observation and measurements, continued during many years, proved that 10 or 11 gallons were sufficient; but in these towns generally the number of water-closets is small.

The results of a few experiments which were made in Sheffield some six or seven years ago will be instructive. Two groups of cottages and a single mansion were selected for experiment; the water was constantly laid on. In one case the consumption was taken by actual measurement by means of a cistern, and in the other two cases by a water-meter. The experiments were made without the knowledge of the inhabitants. One was a case of 16 cottages containing 83 inhabitants, and in these the average consumption, upon a fortnight's trial, was 7½ gallons per head per day. The second case was a group of four houses of about £25 a year rental, containing 26 inhabitants, and here the consumption, for a similar period, was at the rate of 5 gallons per head per day. The third case was that of a large mansion with 13 inmates, a bath, and two water-closets; here the consumption was at the rate of 11 gallons per head per day. The average consumption in the town of Sheffield, including the supply to trade, is 20 gallons per head per day; deducting the trade supply, as ascertained by meter, it is 18 gallons per head per day; but the pressure in Sheffield is, with perhaps two or three exceptions, greater than that of any town in the kingdom, and any leakage, therefore, which might have existed, and which of course would be included in the 18 gallons per head per day, would be much greater than in a town where the pressure does not exceed that to which pipes are ordinarily subjected.

Other instances of what is actually required will be given when we come to treat of the prevention of waste; but it must be clear that there is nothing in the system of constant supply which would necessarily create a larger consumption of water than in that of the intermittent supply. Anything beyond the proper normal requirements of the inhabitants which would be amply met by from 15 to 20 gallons per head per day, even in a town largely supplied with baths and water-closets, is chargeable to defective pipes or defective arrangements and fittings; and now we come to the real difficulties with which the system has to contend.

On this point, and on the extent to which waste may be reduced, I can give several useful examples.

In Cambridge, where the supply has always been constant, but where precautions against waste were neglected till recently, the following are exhibited, for which I am indebted to Mr. Tomlinson, the manager. In the first half year of 1865, at which time no preventive measures had been introduced, the gross consumption per head per day was 31·2 gallons, and the domestic consumption, after deducting water sold for trade purposes, 23·1 gallons per head. A house to house inspection was then carried out —all bad cocks were replaced by those of the best construction, and water-fittings of every description were put into proper repair. The result was that in the first half year of 1866 the gross daily consumption was reduced to 19·56 gallons per head, and the domestic consumption to 11·1, being less than one-half of what had previously obtained.

At Newcastle-on-Tyne the water has always been delivered on the constant supply system; but the consumption gradually increasing to an extravagant point, a vigilant inspection was introduced, and means taken for checking the wasteful expenditure of water—sufficient powers having been granted to the company by a recent Act of Parliament. Mr. Main, the very intelligent manager of this company, writes me as follows:—

"Our gross daily consumption is 30 gallons per head, of which 7 gallons go to manufactures and trades. Considering 23 gallons per head to be excessive for domestic consumption, I was anxious to ascertain precisely where the water went to. For this purpose I had the town divided into small districts of three or four streets, completely isolated, and put on a street meter to register the daily consumption. On comparing the results in districts where water-closets prevailed with those in which there were none, or comparatively few, it was soon apparent that the water-closet, generally from being out of order, but in several cases from the crank-handle being purposely propped up, was the great consumer." The following are a few of the results:—

	No. of Inhabitants.	Water-closets.	Consumption per head per day.
1. Eldon Square	170	29	70 galls.
2. Leazes Terrace	275	47	71 ,,
3. Rye Hill and adjoining streets	880	118	55 ,,
4. Framlington Place and ditto	770	124	80 ,,
5. North Parade and ditto	725	173	60 ,,
6. York Street and ditto	190	25	61 ,,
7. Lancaster Street and ditto	145	12	62 ,,
Prudhoe Street and ditto	1575	10	11 ,,
Thornton Street and ditto	1930	None.	23 ,,
Abinger Street and ditto	1595	53	30 ,,
Shield Field District	4845	138	21 ,,

"In order to stop so flagrant a waste, we set on a staff of men to examine every water-closet and tap, and report them, leaving a notice that if not put in order within three days the supply would be stopped. After

the lapse of three days another set of men followed, inspecting only those places reported as leaking, and shutting off the water where the notice had been disregarded. In this way we stopped an immense waste, the effect being immediately apparent in increased pressure throughout the town. But that measure was only for a temporary purpose, and could not be relied upon to effect any permanent saving, and for upwards of twelve months we have been going on systematically replacing the present water-closets with Guest and Chrimes's double-valve cistern and Thompson and Murray's valve cistern, neither of which can be propped to cause a continuous run. In this way we have reduced No. 3 district from 55 to 34 gallons per head, No. 5 district from 60 to 39 gallons per head, No. 6 district from 61 to 25 gallons per head, and No. 7 district from 62 to 26 gallons per head.

"The others are not so complete that I can give you the results accurately.

"In carrying out the change we occasionally meet with opposition, but not as yet to any extent. In one district we put new double-valve cisterns into every house by arrangement with the landlords. The result was as follows:—Tyneside Terrace and Mitford Street, number of inhabitants, 930; water-closets, 86.

"Before the improvement the meter registered (from December 20 to March 22) 2,771,500=32·4 gallons per head per day. After the improvement (from April 12 to June 26), 1,160,020=16·6 gallons per head per day."

In a subsequent letter, dated the 17th of this month, Mr. Main writes:—

"I now subjoin particulars of a large district, consisting entirely of tenemented property, where several tenants are supplied at one tap. You are aware how large a proportion of Newcastle consists of property of this description, and I was anxious to show you the results of our improvements in a district different from any of those previously given. I may mention that the overhaul in this large district has been more thoroughly carried out than in any other.

"Diana Street and adjoining streets, number of inhabitants, 5605; water-closets, 60.

"Consumption per head per day before improvement in water-closets and taps, 31 gallons; after improvements, 12 gallons.

"The small consumption which generally prevails in the manufacturing towns of the north of England may, to a great extent, be owing to the custom which has commonly been adopted by the water companies and several of the corporations of doing their own plumbing work.

"It is their interest to employ pipes of such strength, and fittings of such approved construction, and to execute their work in such a manner as to prevent as far as possible all waste from leakage and bad taps. They do their plumbing, therefore, not for the purpose of carrying on a lucrative trade, but for securing thoroughly good materials and workmanship, and the best results to all parties have followed.

"Shortly after the introduction of a new and ample supply of water into Manchester in the year 1850, the old system of intermittent supply was superseded by that of the constant system, but it was only gradually introduced. The city was divided into small districts, and all means were taken for seeing that all the pipes and water-fittings were of the best description, and suitable for use under the constant supply system, before the inhabitants were allowed to enjoy that advantage. At my suggestion, the corporation, in whose hands the water supply was, adopted the plan so successfully pursued in other towns, of being their own plumbers; but the clamour and opposition of the plumbers of the city was too much for popular representation, and the system was gradually relaxed. They discontinued the plumbing, but they established a warehouse or shop for the sale of fittings, purchasing the very best, and, as far as possible, compelling the plumbers to purchase from them, allowing the adoption of none which were not approved.

"After a time this was discontinued, and a certain number of plumbers were licensed or authorized to do the requisite work on certain conditions, with which they were bound to comply. These regulations are still continued, and there is probably no great water supply in the world which is administered with as little waste and with as much convenience and comfort to the inhabitants."

It will be thus seen that where everything is in good order, and both the water provider and the water consumer do their respective duties properly, there is no disadvatage to either party by the supply of water on the constant supply system, while the advantage to the consumer in the facility with which he obtains water, and the trifling cost at which it can be introduced into his premises, are incomparably greater than can be enjoyed under the other system. Where, however, the intermittent system has hitherto prevailed, the desirableness, and, indeed, the practicability, of abandoning it and adopting the constant supply, depends very much upon the consumers. If they will submit to such regulations as are necessary for preventing waste, there can be no difficulty in introducing constant supply; it will consume no more waste than the intermittent system. The only changes which are required are the abandonment of all bad fittings, such as common ground-taps, leaky cocks, and wasteful water-closets. The cisterns already existing in houses which have been adapted to the system hitherto employed may remain if it be the will of the owner or occupier that they should. If they are large enough they do now practically give a constant supply, and it is only just to the provider of water that care should be taken to prevent improper use. Those who prefer to abandon their cisterns and to take their water direct from the pipes, can do so at very little expense. In all new buildings there would be no necessity for the expensive paraphernalia of cisterns; a stop-cock on the service-pipe of the house would enable the water to be turned off whenever repairs or alterations were required to be made within the house. Little inconvenience is felt by grouping a number of houses together, commanded by one stop-cock; and, indeed, it may be said that complaints of inconvenience arising from interruption to the supply of water are scarcely ever heard in towns where the constant supply is at work. If the public will not submit to introduce the best description of fittings, and to prevent waste, and will not subject themselves to the vigilant inspection which ought to be exercised by the provider of the water, and be willing to correct everything which requires correction, it will be difficult, and in some cases impossible, to introduce the constant supply.

About ten or twelve years ago the city of Chester was supplied upon the constant system, after the inhabitants had been long accustomed to the intermittent. The company gave ample notice of their intention to change the system, and earnestly invited the inhabitants to co-operate with them in preventing waste. This call was not responded to by the consumers, and the result was that the consumption increased so much that the pumping-engines, which, upon the intermittent system, were capable of affording all the supply required by working twelve hours a day, were compelled to work night and day, in order to supply what was required upon the constant system. The company were obliged, in self-defence, to return to the intermittent mode, on which the city is now supplied. This, however, is the only case of failure in my experience, and it may perhaps be accounted for by want of power or resolute determination on the part of the company in bringing offenders to justice.

I must not omit, however, to notice the great consumption of water which obtains in many of the Scotch towns, and notably in Glasgow. There, under both the intermittent and constant system, the quantity supplied has been enormous; but it is easily accounted for, and might be remedied.

Under the old system of intermittent supply, when the water was pumped from the Clyde, the gross consumption was at the rate of 40 gallons per head per day, 36 gallons of this being due to domestic consumption and waste, the latter element being mainly chargeable with the extravagant consumption.

When rearranging the piping for the reception of the water from Loch Katrine, I felt it important to draw the attention of the corporation to the large consumption, and to the growing habits of waste; and I cannot more clearly explain my views than by reading a portion of a report which I had occasion to make on the rearrangement and extension of the city piping in February, 1858. In this report, after alluding to the state of things which existed, I say:—

"I will not enter into the question of whether 'constant supply' or 'intermittent supply,' as they have been respectively termed, is the best system for the supply of a town. It is your intention to give the inhabitants the full advantage of the Loch Katrine water constantly laid on, and, from the elevation of the Mugdock reservoir, always at high pressure.

"The two systems have each been warmly advocated, but my observation and experience lead me to the conclusion that the 'constant system,' when properly regulated, is much the most convenient on the whole, the least expensive to the tenant, and not more costly, either in works or water, than the other. It is no new or untried arrangement, as has been erroneously supposed, for it is the common mode in which most of the large manufacturing towns of the north of England have been supplied for the last thirty years.

"Where this system has always been the one adopted, or where it has been in existence for a considerable period, with everything in good order, and under vigilant regulation, the consumption of water is, I believe, less than it would be in the same town under the intermittent system, supposing that in both cases an unstinted supply be given; but where a change has to be made from the intermittent to the constant system, very great waste is commonly the result; and it requires the utmost vigilance and the most persevering attention, and indeed severity, to prevent it.

"Under the intermittent system people become negligent of the state of repair of their pipes and water-fittings; they keep their taps constantly open, and are heedless about the waste which frequently takes place during the periods of the water being laid on. The water-works officials generally wink at this state of things, from a feeling that the waste only takes place within a limited area, and for a limited number of hours, and that it is effectually prevented during such periods as the water is wholly shut off.

"Should, however, the same state of things exist under a system of constant supply, and at high pressure, the waste would be enormous, and even Loch Katrine would be found inadequate to meet it.

"In introducing the constant supply, therefore, where it has never been in use before, the inhabitants should be previously prepared by due notice of the time at which it would be commenced, by imperative injunctions to put their pipes and taps into good order, and to abandon the use of all vessels for collecting or storing water, except those properly furnished with ball-cocks. These injunctions should be followed by the most active supervision, and by the most unmitigated severity which the law admits of in all cases of neglect. By degrees the inhabitants would become accustomed to the new system, and after a time it would work harmoniously and advantageously for all the parties interested.

"These observations apply only partially to Glasgow, for in Gorbals, and over a large portion of the city north of the Clyde, the supply has for a long time been constant; but there are districts in which the intermittent system still prevails, and over the whole city the pressure and the consequent waste from bad fittings will be materially increased."

Then with reference to the waste from water-closets, I say:—

"Nothing can be a greater luxury than a well-kept water-closet, perfect in all its parts and appurtenances, properly separated from the living-rooms of a house; and in a rich man's residence, or in the hands of those who will spare no labour nor money to erect them first, and to maintain them afterwards in perfect efficiency, it is no doubt the *ne plus ultra* of comfort, convenience, and cleanliness. But all who are in the habit of using them know how much trouble there is to keep them right, how frequently they go out of repair, and what a terrible nuisance it is when they do. Careless housemaids will put down mops or brushes, spoons or cinders, just as it may happen; working apparatus will get out of order, and soil-pipes and drains will occasionally become stopped. These inconveniences, however, occurring to a man who can afford it, may be rectified by pains and money, and they do not amount in such a case to an argument against the use of an arrangement which possesses so many counterbalancing recommendations and advantages. But change the scene to the house of the poor man, or to the dwelling of one who is careless of personal comfort or, perhaps, decency, and all these inconveniences become evils of very serious magnitude. There is seldom space enough properly to separate the water-closet from the apartments in which the family live, and if it gets out of order it will either be carelessly neglected, or it will cost money to repair which cannot be afforded. If the arrangement admit of it, most likely the water will be kept constantly running, and the soil-pan open—the effect of which is to waste the water, and to permit the free escape of all noxious effluvia from the drains and sewers into the ill-ventilated apartment in which the family resides. Nothing could be more perfectly contrived for poisoning the atmosphere and engendering disease. Nor is this all. The habits of the lower orders are such as to render a state of disrepair a thing of more common occurrence with them than amongst the upper classes. It is the readiest receptacle for anything that has to be thrown away, and the absence of toys and amusements amongst the unfortunate, cribbed, and cabined children of the poor, affords a strong temptation to resort to so capital a substitute as the plug of a water-closet, the unconscious little urchins never dreaming that on every repetition of their fun in opening and shutting the pan they allow the escape of poisoned air.

"The ordinary water-closet, under the best of circumstances, is generally productive of much waste of water, and if the cistern supplying it be also furnished with a waste-pipe, the water running away imperceptibly and uselessly may be very considerable.

"I would, therefore, respectfully beg your attention to this subject, both on account of the cost of the water and the health of the city, and urge you

to institute very active supervision and the compulsory use of apparatus of the most approved construction, so as to reduce or remedy the evils I have pointed out. Many amongst the poorer classes are, no doubt, as careful to have everything in good order and as clean and sweet as their richer neighbours, but I apprehend this is not the ordinary rule, and much improvement must take place in the habits of the lower orders generally before these remarks are altogether inapplicable."

Then as to cisterns:—

"A further active agent in waste is the old system of cisterns, which is the necessary accompaniment of an intermittent supply, and which, therefore, prevails over the whole city—Gorbals to a great extent included—in consequence of the diminution of pressure in the pipes.

"The use of cisterns is, I believe, indispensable at present, and under any system of supply they are attended with so many advantages and conveniences, that it may frequently, perhaps generally, be desirable to retain them. Under constant supply, cisterns are not absolutely necessary, except to water-closets; but, as they have the effect of lessening the pressure, the waste from bad taps and imperfect fittings is reduced by their use, if they themselves are properly fitted up with unexceptionable ball-cocks to shut off the water when the cistern is full. If this is not attended to, the water which may pass off unperceived from the waste-pipe of the cistern may be very considerable; and as the cisterns are frequently placed on roofs and in other inaccessible places, they are not easily inspected, and are never visited except in cases of necessity."

But one of the great causes of waste in Glasgow was the wretched character and condition of kitchen taps and the water-fittings generally. A rather startling account of these elements of waste was contained in a report prepared from careful observations and measurements made by Mr. James M. Gale, in Gorbals, in 1850:—

"From these it appears that the average daily waste by 135 families from badly constructed or imperfectly fitting kitchen taps alone, amounted to 108 gallons per family, or 20 gallons per head per day.

"In one staircase while one careful man wasted nothing, another negligent fellow ran down his sink-stone, for no useful purpose to himself, no less than 850 gallons a day.

"This waste is principally caused by the universal custom in Glasgow of using the common ground-tap, the worst description of tap for water under pressure which can be adopted, and which has long since been exploded in all improved and well-regulated water-works in England."

No great attention was paid to the warnings which this report contained till after the introduction of the Loch Katrine water.

This took place at the close of 1859, and by March, 1860, the whole city north of the Clyde was receiving this water. On the 6th of June, only three months later, I felt compelled to make the following report:—

"I must draw your attention to the present consumption of water, which is increasing so rapidly as to be really alarming, and quite warrants the apprehensions I felt and the pains I took to guard you against it when writing my report on the city piping in February, 1858. Referring then to the habits of waste which existed, and to the imperfect state of the water-fittings, I observed that, should the same state of things continue under a system of constant supply, and at high pressure, the waste would be enormous, and even Loch Katrine would be found inadequate to meet it. At the time I wrote this the consumption on the north side of the river was a little under 13 million gallons a day. In November last, eighteen months later, it had increased to 14 millions, and in the beginning of March of this year, after the whole of this city was supplied with Loch Katrine water, it was 15 million gallons per day. It has gone on increasing since then till it now amounts to 18 million gallons per day, being an increase of 3 million gallons a day in three months. The consumption by the city was measured at the Mugdock reservoir every hour for 24 hours consecutively in the beginning of this week. The greatest draught is about one o'clock in the day, when it is at the rate of 22 million gallons a day, and the least at two o'clock in the morning, when it amounts to about 14 millions. At this time of the night nearly the whole of this quantity must be wasted.

"The total consumption of the city from Loch Katrine and Gorbals together is 22 million gallons a day, being at the rate of about 50 gallons per head, and just twice, in gross quantity, as much as Manchester and Salford take for a larger population."

Upon this statement Mr. Gale, the resident engineer, was instructed to institute such an examination as would lead to the discovery of the cause of the excessive waste of water. He found that from badly constructed and leaky taps alone the waste amounted to 7,200,000 gallons per day—equal to 20 gallons per head—the value of which, if sold for trade purposes, would have been about £50,000 per annum.

What followed after this will be seen from a report I addressed to the Water Committee in January, 1862:—

"I must again draw your attention to the rapid increase in the consumption of the water. The city, on the south of the Clyde, has exhausted its own supply from the Gorbals works, and is now assisted by a supply from Loch Katrine.

"The gradual increase in the city, north of the Clyde, has been as follows:—In the beginning of 1858 the daily consumption was 13 million gallons; in November, 1859, just before the introduction of Loch Katrine water, it had risen to 15 million gallons; in March, 1860, the whole of the city north of the Clyde was supplied from Loch Katrine, and by June the consumption from that source had arrived at 18 million gallons per day.

"I then brought the subject prominently under your notice. Careful investigations into the causes of waste were made by Mr. Gale by your directions. He found that no less than 7,200,000 gallons a day were run to waste by leaky and bad taps alone, a quantity which he estimated at a money value of £50,000 per annum. Stringent supervision was introduced, and other measures taken for remedying this enormous evil, and by October the quantity had been reduced to 13 million gallons, being a saving of 5 million gallons a day in three months.

"At this point the consumption remained for a few months, but it is again steadily on the increase. At the commencement of 1861 it was, in round numbers, the same as it had been brought down to in October—viz., about 13 million gallons a day. It was maintained at this low point to some extent by so closing the valves as to reduce the pressure in the lower parts of the city to what was equivalent to only 70 ft. in height, thus throwing away the advantage of high pressure for the extinction of fires and for other purposes.

"By Midsummer the consumption had increased to 15½ million gallons. In August the Loch Katrine water was turned on to the west end of the Gorbals, and in September the pressure in the pipes during the night was increased to about 140 ft. These arrangements, and a recurrence no doubt to the old habits of waste, brought up the consumption to upwards of 17 million gallons per day, which, added to the supply from the Gorbals works, made the total daily quantity supplied to the city 21 million gallons, or 46 and two-thirds gallons per head per day on the population of 450,000, who are supplied by the two works.

"Here is an increase in one year of 4 million gallons per day."

There is a further report on this subject from Mr. Gale, in November, 1864, giving the details of inspection and the then condition of the taps and water-fittings. Special regulations had been established for the introduction of improved apparatus, but there still remained 41 per cent. of those in use which were not consistent with these regulations.

This case of Glasgow will no doubt be much relied upon by the opponents of the constant supply system; but the extravagant consumption is clearly due to causes which may be remedied, and to the fact that the corporation have never resolutely and preseveringly set to work to apply the requisite remedies. The people of Glasgow look upon Loch Katrine as practically inexhaustible. The works are constructed on a scale for bringing more than twice the quantity now used. They are their own property, and as the water is supplied by gravitation, the excessive waste which takes place costs them nothing at present.

I see no reason to doubt that if in this great metropolis the providers of water and the consumers of water will each do their duty and work harmoniously together, the citizens may enjoy the inestimable benefit of an unlimited supply of water constantly laid on without consuming a gallon more water, if indeed as much, as is now supplied by the water companies.

GAS LIGHTING BY ELECTRICITY.

One of the most persevering inventors of the present times is Mr. Samuel Gardiner, of this city, whose various improvements connected with the use of electricity for gas lighting have been duly chronicled in our pages. When the dome of the Capitol at Washington began to rise, it became a serious problem how to light the immense concave. Mr. Gardiner was the only man who proved able and willing to undertake the solution of the question, and after several years of constant labour, his efforts have been crowned with complete success.

We copy the following interesting description from the report of the official committee appointed to examine the condition of the work, Messrs. Shaffner, Pike, and Knight:—

The gas-pipe connexions consist of circles of burners at 45, 80, and 165 feet from the floor of the rotunda, and are furnished with 300, 325, and 425 burners respectively. In addition to these, a cluster of 90 burners is placed in the tholus at a height of 264 feet from the floor, and being 60 feet above the crown of the dome is, of course, invisible from the interior, but is a beautiful object viewed from the Capitol grounds, and visible at a distance of many miles.

The flow of gas at each tier, and in the tholus, is equalized by a regulator, and governed by a stop-cock, the latter being opened and closed by electro-magnetic engines in their immediate vicinity, worked from the battery, the central brain of the apparatus from which ramifies the nervous fluid which vitalizes the motive agents and the illuminating coil of each of the 1130 burners.

The battery occupies an elliptical room 45 by 36 feet, and consists of 200 glass jars of a depth and diameter of about 13 inches, containing two zinc plates 9 by 10 inches, weighing 6 pounds each, and an interposed carbon plate, all supported by suitable insulators in the acid bath. It is disposed on benches in concentric series in the room, and arranged in sections of 20 jars each, to be brought into service as required.

The connexions consist of five miles of No. 10 copper wire, doubly wrapped with linen yarn, and, when necessary, encased in india-rubber tubing; this is securely laid in protecting pipes or through passages drilled through the walls, the return circuit from the engines and the burners being made through the gas-pipes.

The burners used have an an indestructible lava tip, which acts as an insulator, and each is provided with an insulated coil of platinum wire, placed on one side of the orifice, so as not to interfere with the free exit of the gas, which is lighted by exposure to the red-hot metal when the electric connexion is made.

The tiers of burners are divided into sections of from 30 to 50 burners, each section having independent connexion with the instrument, so that a tier being divided into ten sections, it is lighted by a corresponding number of pulsations following the flow of the gas, which is turned on by the electro-magnetic engine belonging to, and in the vicinity of the tier. The manipulation which by successive pulsations operates the engines, makes the series of illuminating connexions, and registers the work, is performed in a passage-way leading north from the floor of the rotunda, and perhaps 50 feet from the battery.

The electro-magnetic engines consist of a double helix, with a sliding armature, on which is a latch which operates a ratchet-wheel on the axis of the stop-cock. The operator, by a succession of electric connexions, works the armature, piston, and turns the plug of the stop-cock such a fraction of a revolution as is represented by a number of teeth on the ratchet-wheel.

The handsomely engraved dial-plate, of silver, has keys, eleven in number, and with a corresponding number of vernices.

The primary electric connexion with the battery is made by a stud in the central key, which, by rotation, is made to bring such a portion of the battery into play as may be required, a vernice indicating the extent of battery connexion which takes place in successive sections of 20 jars.

The surrounding keys, ten in number, are equally divided between the duties of turning on the gas and lighting the same at the five levels for which the dial-plate and keys are adapted. But four of these are yet arranged, consisting of the tiers at the elevation of 45, 80, and 165 feet respectively, and the tholus at 264 feet.

The fifth may be used for a proposed tier at the spring of the dome, or a circle to illuminate the picture, as you may desire.

Each gas-key has a dark and a light segment on its disc, which are exhibited at an opening in the dial-plate, in correspondence with the closed and open position of the stop-cock, which governs the flow of gas at the tier represented by the said key.

Each lighting key has a pointer, which indicates on its vernice the extent to which the electric connexion has been made in the sections of the tier to which it belongs.

The apparent column of light in the tholus, derived from 90 burners, with reflectors and prisms, was designed by Mr. Gardiner, and has a beautiful effect.

The prospective cost of maintenance, so far as it consists in the waste of materials used in the 200-jar battery, may amount to 600 pounds of zinc, 50 pounds of mercury, and 50 gallons of sulphuric acid per annum.

So far as appears to us, the apparatus requires but proper ordinary care and attention to maintain it in effective condition, and the lighting of the burners can be more effectively and economically accomplished by the use of this apparatus than by any other appliance that has come under our notice.

The workmanship of the dial and appurtenances, and the electro-magnetic engines, is substantial and elegant, and deservedly attracts great attention from expert and intelligent casual visitors, from whom the effect of the manipulation of the keys elicits murmurs of applause.

Many doubts as to the ultimate success of the enterprise have arisen in the minds of persons quite familiar with the science, when the great amount and proximity of the metal in the iron dome was considered, and on account of other difficulties incident to the scale of the apparatus and connexions, but these are happily set at rest, and the appropriateness of the exhibition of American enterprise in the national Capitol has given zest to the congratulations tendered to the inventor and contractor, Mr. Gardiner.

We have to report, in conclusion, that the work has been well done; its efficiency and practical performance leave nothing to be desired; its permanency may well be admitted from the solid and honest character of the work; and the economy with which it performs its duty is beyond dispute.

Mr. Gardiner's improvements are applicable to the turning on, lighting, and turning off gas for street lamps, public buildings, and private dwellings. We understand that he is now engaged in developing a project for the lighting of gas in theatres, saloons, and dwellings in this city, with an arrangement for an electric reservoir, so that when connexion is made with a wire passing through the street, the burners in the connected building will be lighted or shut off at the will of the occupants, by merely pressing a key. This is an extensive enterprise.—*Scientific American.*

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF JANUARY, 1867:—

Maximum light estimated by sperm candles according to the Act . .	14·9
Minimum light—sperm candles	13·2
Average light—sperm candles	14·1
Traces of ammonia, indicated by turmeric test-paper . .	6 times out of 12
Traces of sulphuretted hydrogen, indicated by lead test-paper . .	Not at all.

The illuminating power has been maintained during the past month above 13 candles, the highest being 14·9 and the lowest 13·2. Ammonia has been detected 6 times out of 12. In 100 cubic feet of gas there was above 13·7 grains of sulphur, which is below the limit of the Act of Parliament. There was no sulphuretted hydrogen at any time detected.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE WATER SUPPLIED IN ST. MARYLEBONE, IN JANUARY, 1867:—

JANUARY.	Total Solid Matter in degrees or grains per Imperial gallon.		* Loss by Incineration of Solid Matter in previous column.		Ammonia.
	Dec., 1866.	Jan., 1867.	Dec., 1866.	Jan., 1867.	
Distilled Water . . .	0°	0°	0°	0°	0°
West Middlesex water	20·28	20·76	0·88	1·20	—
Grand Junction water	20·96	20·40	0·92	1·14	—

* The loss by incineration represents the amount of organic and other volatile matters contained in 70,000 grains of water.

During the past month the water supplied to the parish by the West Middlesex and Grand Junction Water Companies contained an amount of organic matter somewhat in excess of that of many previous months; the water supplied by the former company showed an increase of 0·32, or three-tenths of a grain per gallon, and that supplied by the latter company 0·22, or about two-tenths of a grain per gallon. This increase can hardly be considered a subject for complaint, since it is highly probable that the late severe frost must have interfered with the ordinary means of efficient filtration.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE GAS SUPPLIED IN ST. MARYLEBONE, IN JANUARY, 1867:—

JANUARY.	Illuminating Power in Sperm Candles.			Mean Pressure in 10ths of an inch.	
	*Mean of 25 Observations.	Highest.	Lowest.	Highest.	Lowest.
Imperial Company's gas	14·60	15·15	13·28	21·00	8·57
Chartered Co.'s common gas . .	12·53	13·43	11·28	32·91	12·33
Chartered Co.'s cannel gas . . .	20·53	22·05	19·13	26·20	10·33

* Each observation consists of 10 readings of the photometer.

The Imperial gas showed throughout the month a mean illuminating power equal to 14¼ sperm candles, or about 21 per cent. more light than what the law requires; twice it was 15 candles, and on 14 other occasions it exceeded 14 candles. Its pressure was uniformly fair and steady. The mean amount of sulphur found in 100 cubic feet did not exceed 10 grains. The common gas of the Chartered Company gave a mean intensity of light of about half a candle in excess of the standard, 5 times it exceeded 13 candles, but on 5 other occasions it did not reach 12 candles. Its pressure was uniformly very good. The mean quantity of sulphur in 100 cubic feet of gas was less than 15 grains. The cannel gas of the same company produced also a mean light of half a candle above the standard, but on 7 occasions it fell below it. The pressure was generally high, but sometimes unsteady. The mean quantity of sulphur found in 100 cubic feet was about 12 grains. All the gases were uniformly free from sulphuretted hydrogen, and all as uniformly contained some traces of ammonia. The above results are obtained from the gas manufactured by the Imperial Company at their Fulham works, and from the common and cannel gas of the Chartered Company at their works in the Horseferry Road, Westminster.

YOUNG'S PARAFFIN LIGHT AND MINERAL OIL COMPANY.—A meeting of the partners of this company was held last week at the Queen's Hotel, Glasgow, and a report and balance-sheet for the year ending the 31st of December last was submitted by the directors, from which it appeared that, after deducting depreciation from the works and plant, there remains a balance of £35,504 13s. 8d. profit. The directors recommended that the dividend of 5 per cent., as restricted by the Articles of Association, be paid, and a bonus of 4 per cent. on the paid-up capital be added to the stock of the partners. The following gentlemen were elected directors of the company:—James Young, Esq., of Limefield; John Pender, Esq., Manchester; John Orr Ewing, Esq., of Levenfield; Professor Lyon Playfair, C.B., Edinburgh; John Moffatt, Esq., Ardrossan; James Arthur, Esq., of Burshan; James King, Esq., of Campsie; Hugh Bartholomew, Esq., Glasgow; William M'Ewen, Esq., Glasgow; and James Young, jun., Esq., of Limefield. Mr. Alexander Moore, C.A., was appointed auditor of the company.

REDUCTION IN THE PRICE OF GAS AT WALLASEY.—The Wallasey Local Board have resolved to reduce the price of gas from 6s. per 1000 feet to 4s. 6d., and to increase the salary of Mr. Harris, the manager, from £200 per annum to £250. The gas receipts for last year, after deducting the working expenses, and every other charge, left a clear profit of £2022, which has been expended principally in extensions. On the water-rate accounts there was a deficiency of £240.

PROPOSED TESTIMONIAL TO MR. FLINTOFF.—The *Dundee Courier* states that a public meeting has been held in Perth, and that one is about to be held in Dundee, in order to initiate a subscription for the purpose of presenting a testimonial to Mr. George Flintoff, of London, gas engineer, "through whose efforts the light of gas had been enjoyed in that town at the cheap rate of 4s. 2d. per 1000 feet for the last five years." The chairman said that the efforts of Mr. Flintoff against gas monopolies had saved £4000 a year to the gas consumers of Perth, and £100,000 a year to those of Scotland generally. The meeting was numerous, and sanguine hopes were expressed that a large sum would be raised.

THE FROST AND GASLIGHTS IN MOSCOW.—The secretary of the City of Moscow Gas Company, Limited, has addressed the following letter to the editor of a daily paper in correction of some misstatements as to the effect of frost on the gaslights in Moscow:—"Sir,—In an article from your correspondent at St. Petersburgh, published by you yesterday, it is stated that at Moscow on the night of the 31st ult. the cold was so intense that the mercury was frozen, and all the gaslights in the town went out. It is perfectly true that the severity of the weather in Russia this winter has been such as has not been experienced there for many years, the thermometer descending even as low as 38° Reaumur, which is equal to 83° of frost, or 51½° below zero, Fahrenheit. This extraordinary cold froze petroleum, and put out the public lights of that description, but it had no such effect upon the gaslight, which continued burning without intermission. As this is a fact of importance to those of the public who are interested in this company, I have to request that you will insert this in your paper to-morrow.—I am, sir, yours most obediently, H. C. WISS, Secretary."

THE ELECTRIC LIGHT IN FRANCE.—The immense success of the lighting up of the ball *fête* of the skaters at the Bois de Boulogne caused His Majesty the Emperor of the French to make a trial again of the electric light for illuminating the courts of the Tuileries and the Carrousel. On Saturday, Feb. 2, M. Serrin was invited to place two of his lamps on the Arc de Triomphe of the Place du Carrousel. The light being enclosed in two ellipsoidal enamelled urns, made by M. Paris, was not only unfatiguing to the eye, but it was contemplated with pleasure. Two electric burners are evidently too few for this immense space, and yet it was entirely lit up. In the interior of the court of the Tuileries the light was better than that of all the gaslights; on the Place du Carrousel the gas was nearly all eclipsed. The continuity and fixity of the light were truly astonishing. When, according to the adopted project, the iron railing forming the present enclosure of the courtyard of the Tuileries is advanced as far as the middle of the Place, four or six lamps lit by electricity, and placed above the railings, will furnish an illumination the most splendid, inoffensive, and economical that can be imagined. It seems to us impossible that they will hesitate a moment in adopting it, the more so as the actual mode of illuminating the two Places is so inefficient that they are truly plunged in obscurity.—*Chemical News.*

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.			Glasgow.			Newcastle			Wales.			Yorkshire, Derbyshire, and Staffordshire.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
Pig Iron, No. 1	3	15	0	3	15	0	2	12	6	3	10	0	3	10	0
1¼ and 2-inch Socket-pipes	7	10	0	6	0	0	6	15	0	6	15	0	7	10	0
2½ and 3-inch ditto	7	0	0	6	0	0	6	5	0	6	10	0	7	0	0
4 and 5-inch ditto	6	10	0	5	10	0	5	15	0	6	0	0	6	10	0
6 inches and upwards ditto	6	5	0	5	0	0	5	10	0	5	15	0	6	5	0
Retorts, 1st fusion, hot blast	6	0	0		—		5	5	0	5	10	0	6	0	0
Ditto, 2nd ditto, cold ditto	7	0	0	5	15	0	5	15	0	6	0	0	7	0	0
Tank-plates, ¼ thick and above	6	10	0	5	10	0	5	10	0	5	15	0	6	5	0

WROUGHT-IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.		1½ in.		1¼ in.		1 in.		¾ in.		½ in.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1	8	1	0	0	10	0	7	0	5	0	4½
Ditto ditto, from 6 inches to 18 inches—each	3	0	2	0	1	9	1	3	1	0	0	9
Connecting-pieces, or Long Screws	3	6	2	3	2	0	1	6	1	2	0	11
Bends, Springs, and Elbows (wrought iron)	3	9	2	3	1	9	1	0	0	10	0	8
Tees, wrought or cast	4	0	2	6	2	0	1	6	1	1	0	10
Crosses, ditto	4	6	3	0	2	6	2	0	1	6	1	2
Iron Cocks	17	6	9	6	7	6	4	6	3	3	2	6
Ditto, with brass plug	28	0	16	0	13	0	7	0	5	6	4	6
Diminishing Sockets, Caps, Plugs, and Nipples	1	3	0	9	0	8	0	6	0	5	0	4
Plain Sockets	1	0	0	8	0	7	0	5	0	4	0	3
Syphons, 3-quart	15	0	14	0	13	6	13	0	12	0	—	

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—	
East Castle, Haswells, Nettlesworth Primrose, and South Pelaw	7s.6d
Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	7 9
Burnhope, Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Lanchester Pelaw, Medomsley, Mickley, New Pelaw, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, West Pelaw, Wearmouth Hutton, and Witton	8 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	8 3
Brancepeth, Dean's Primrose, New Pelton, Pelton, South Peareth, Stella, Urpeth, Washington Hutton, and West Leverson	8 6
Ramsay's Newcastle Cannel	20 0
Wigan Cannel (at Liverpool)	17 0
Scotch Cannel:—	
Boghead (at Leith)	35 0
Kirkness, best (at Burntisland)	28 6
Capeldrae, 1st quality (at ditto)	28 6
Cowdenbeath	11 0
Ditto, 2nd ditto (at ditto)	18 6
Lesmahago (at Glasgow)	29 0
Ditto (at Granton)	30 0
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	23 0
Pirnie	15 0
Lothian's Cannel (at Leith)	28 0
Myles' Cannel	23 6

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—	
Chatham and Rochester	5s. 9d
Cork	9s. to 9 6
Dover, Folkestne, & Ramsgate	6 6
Dublin	9s. 6d. to 10 0
Exeter Quay	9 0
Ipswich	5 6
London (from Leith)	8s. to 8 6
London (Pool)	6s. to 6 3
Lowestoft and Yarmouth	5 3
Portsmouth & Southampton	7 9
Plymouth	8 0
Shoreham	7s. to 7 6
Whitstable	5s. 6d. to 6 0
Weymouth	8 0
Foreign.—Per Keel:—	
Barcelona	£20 0
Bordeaux	13 0
Boulogne and Calais	7 10
Cadiz	—
Cronstadt	—
Copenhagen	7 5
Genoa	£18 10s. to 19 0
Hamburg	8 10
Havre de Grace	9 0
Leghorn	£18 10s. to 19 0
Lisbon	12 0
Rotterdam	8 0
Stettin	£8 10s. to 9 0
Trieste	19 0
Venice	21 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2 10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 0
Ingham's ditto (at Wortley), p. 1000.	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7 0
Tough Cake Copper, p. ton	85 0 0
English Pig Lead, p. ton	19 15 0
Welsh Bar Iron (in London), p. ton	6 7 6
Foreign Spelter, p. ton	21 5 0
English Block Tin, p. ton	90 0 0
Banca, p. ton	88 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
8000	10	Anglo-Romano . .	10 0 0	9 0 0	11 to 12
5000	20	Bahia (Limited) . .	20 0 0	4 0 0	16 10 0
1000	20	Do., preference .	20 0 0	10 0 0	27 10 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 10 0
30000	5	Bombay (Limited) .	5 0 0	£5 intr.	4 to 4¼
10000	5	Do., third issue .	4 0 0	£5 intr.	3 to 3⅛
10000	20	British, Limited . (Norwich, Huit-Sculcoates, Hanley, Tunstall & Sheiton (Potteries), Trowbridge, & Holywell.)	20 0 0	10 0 0	27 to 29
12000	50	*Chartered*	50 0 0	8 10 0	50 to 52
6000	50	Do.	35 0 0	8 10 0	35 to 37
10000	20	*City of London*, A shares	20 0 0	8 0 0	26 to 28
10000	10	Do., B shares	10 0 0	4 0 0	6⅞ to 7⅛
8000	10	Do., new shares.	10 0 0	8 0 0	13 to 14
25000	25	City of Moscow (L)	25 0 0	£7 intr.	17 to 17⅛
17490	25	*Commercial* . . .	25 0 0	10 0 0	34 to 35
2500	20	Continental Union.	20 0 0	8 0 0	14 to 15
17500	20	Do.	15 0 0	8 0 0	9 to 9¼
10000	20	Do., preference .	20 0 0	7 0 0	
5827	5	County & Gen. (L)	5 0 0	nil.	
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	nil.	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	14 to 15
5000	10	Do., preference .	10 0 0	6 0 0	12½ to 13
10000	10	Do.	2 10 0	7 0 0	2¼ to 3
4000	50	*Equitable*	50 0 0	10 0 0	65 to 66
4000	25	Do., new shares.	25 0 0	10 0 0	33 to 34
23406	10	European (Lim.) .	10 0 0	10 0 0	12⅛ to 12⅜
12000	10	Do., new shares. Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6 to 6⅛
20000	10	*Gt. Cent. Gas Cons.*	10 0 0	10 0 0	11⅜ to 12
5000	10	Hong Kong (Lim.)	10 0 0		7 to 9
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	64 to 65
1300	100	Do., bonds . . .	£100	10 0 0	175 to 180
7000	25	Imperial Austrian.	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	95 to 96
400	100	Impl. Mexican (L.)	75 0 0		
3000	40	*Independent* . . .	40 0 0	10 0 0	53 to 56
3000	10	Do.	10 0 0	5 0 0	7 to 9
3000	20	Do.	12 10 0	7 10 0	13 to 14
7133	50	*London*	50 0 0	10 0 0	60 to 62
5610	25	Do., 1st pref. .	25 0 0	6 0 0	25 to 27
503	50	Do., 2nd pref. .	50 0 0	6 0 0	
214	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781		Do., 1st pref. sh		6 0 0	
11828		Do., 2nd pref. sh		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	3 0 0	3¼ to 4
6000	5	Do., preference .	4 0 0	7 0 0	4 0 0
30000	5	Oriental, Calcutta	5 0 0	8 10 0	5¼ to 5⅜
30000	5	Do., new shares.	1 0 0	8 10 0	1 to 1⅛
10000	5	Ottoman (Limited)	5 0 0		2 to 3
10000	10	Pará (Limited) . .	10 0 0	6 0 0	9¼ to 9⅜
27000	20	*Phœnix*	20 0 0	10 0 0	24 to 24½
3600	100	Do., new	25 0 0	7 10 0	23½ to 24
144000	Sk.	Do.	100 0 0	5 0 0	72 to 74
5000	20	*Ratcliff*	20 0 0	10 0 0	22 to 24
	20	Rio de Janeiro (L).	20 0 0	10 0 0	21 to 23
6959	5	Singapore (Lim.)	5 0 0	3 10 0	
2000	5	Do., preference . Shanghai	5 0 0	7 10 0	
4800	50	*Sth. Metropolitan*	50 0 0	10 0 0	69 to 71
15000	10	*Surrey Consumers*	10 0 0	10 0 0	13½ to 13¾
10000	10	Do., new	5 0 0	10 0 0	6¾ to 7
9000	50	United General . . (Limerick)	50 0 0	4 12 0	27 to 29
10000	10	*Victoria Docks* . .	5 0 0	6 0 0	
3000	10	*Wandsworth & Putney*	10 0 0	7 10 0	13½ to 14
20000	10	Western (L.) A sh.	10 0 0	10 0 0	13¾ to 14
10000	10	Do., B shares.	5 0 0	10 0 0	6¾ to 7
10000	10	Do., C shares.	4 0 0	10 0 0	5⅛ to 5⅜
20000	10	Do., D shares.	1 0 0	10 0 0	1¼ to 2
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 15 0
551	10	West London Junction (Lim.) .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Advertisements.

GEORGE GLOVER & CO.'S
PATENT DRY GAS-METERS.

The advantages of these Meters are best appreciated by a consideration of the evils they avert. The more prominent of these evils are the following:—

1. Inaccurate measurement, and varying registration.
2. Jumping of the lights, and their sudden extinction.
3. Escapes of gas through the plugs being left out, or imperfectly secured, when the Wet Meter has been replenished with water.
4. The gas passing without being registered at all.
5. The temptations and facilities to fraud which it is notorious the Wet Meter presents.

CLASSES X. & XXXI.

6. The damage to house property which the impracticable attempt to keep the lights from jumping, by giving all the pipes a gradual ascent from the Meter, so as to admit of the water trickling back into it, necessarily occasions.
7. The waste of gas from the higher pressure required to work Wet Meters, the possibility of the water freezing, and their axles and moving parts becoming corroded.

These faults, characteristic of the Wet Meter, and fruitful in annoyance, interruption to business, pecuniary loss, and danger, are entirely averted by the use of George Glover and Co.'s Patent Dry Gas-Meter.

It is, besides, more durable than the Wet Meter; and they maintain it in good working order for five years, free of cost to the purchaser; and for any number of years, at half the expense at which the Wet Meter can be maintained.

As regards accurate measurement, correct registration, the absence of temptation to fraud, safety, convenience, and economy, the superiority of their Dry Meter is admitted; and it has come more rapidly into use, both in this country and abroad, than any Meter hitherto manufactured.

The prices may be compared favourably with those of any meters in the market; and they are lower than most.

List of Prices, and all Particulars, may be obtained on Application.

RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.;
127, BOULEVARD DE MAGENTA, PARIS; AND 15, MARKET STREET, MANCHESTER.

WILLIAM & BENJAMIN COWAN,
(ESTABLISHED 1827,)
WET AND DRY
GAS-METER MANUFACTURERS,
BUCCLEUCH STREET WORKS, EDINBURGH.

E. J. & J. PEARSON,
DELPH & TINTAM ABBEY FIRE-CLAY & BRICK-WORKS,
STOURBRIDGE,
PROPRIETORS OF
BEST GLASS-HOUSE POT & CRUCIBLE CLAY;
MANUFACTURERS OF
GLASS-HOUSE POTS, CRUCIBLES, GAS-RETORTS, & FIRE-BRICKS OF EVERY DESCRIPTION.

TO FOREMEN OF GAS-WORKS.

WANTED, at a large Metropolitan Work, a well qualified FOREMAN to take the entire charge of the gas manufacture for twelve hours a day.

Applications, stating age and present occupation, to be sent to G. C. T., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

NORTHLEACH GASLIGHT & COKE COMPANY, LIMITED.

THE above-named Company require a WORKING MANAGER, thoroughly competent to make the gas, carry out all ordinary repairs, and take the meters. The Company's works contain one oven, and one retort. The annual consumption of gas is about half a million cubic feet.

Applications must be made by letter only, and should enclose copies of testimonials to character and efficiency, and name wages expected. All applications must be received on or before the 26th day of February current. Candidates who receive no reply within seven days after that date, may consider their services declined with thanks.

JAMES H. H. HOWARD, Secretary.

Northleach, Gloucestershire.

WANTED, by a Draughtsman, aged 24, a SITUATION, in or near London. Is accustomed to make working drawings of iron roofs, gasholders, and the general machinery of Gas-Works.

Address W. H. C., 30, St. John Street, COLCHESTER.

WANTED, a Set of 4 Cast-Iron Dry- Line Purifiers, 4 feet square, centre-valve, and connexions complete.

Apply to CHARLES LORD, Gas Manager, Whitworth, ROCHDALE.

TO GAS COMPANIES.

WANTED, an Appointment as INSPECTOR of METERS, or Inspector and Fitter to a work in the country.

Address A. B., 127, Lillington Street, PIMLICO, S.W.

AS Manager of Gas-Work—Situation Wanted. Is thoroughly acquainted with the making and distribution of gas, the erection and repair of apparatus, laying of pipes, gas-fitting, and inspection of meters. Is a good clerk and accountant, and can give excellent references as to character and ability.

Address W. S., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a young Man, a SITUATION at gas-fitting, meter fixing, index taking, &c.

Address M. P., care of Mr. Shirley, 26, Laystall Street, Gray's Inn Road, Clerkenwell, LONDON.

A GENTLEMAN who has had con- siderable experience in the designing, erecting, and managing of Gas-Works, at home and abroad, desires to obtain another engagement as MANAGER or ACCOUNTANT to a Gas Company or Corporation. Has first-class testimonials, and can give security if required.

Address D. W., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

COTTENHAM GAS-WORKS.

WANTED a Manager for the Works at Cottenham, near Cambridge. He will have to make gas, take meters, lay service-pipes, and must be accustomed to take sole charge of a small Gas-Work. House, gas, and coals provided at the works.

Written application to be made to the Contractors, STEARS BROTHERS & Co., 3, George Street, HULL, stating age, wages required, also whether married or single, and giving reference to last employers.

WANTED, a Situation as Manager in a small Gas-Work, or SUB-MANAGER or DRAUGHTSMAN in a large Gas-Work, by a young married Man, who has had long and good experience in gas engineering, and can show first-class testimonials.

Address D. S. A. 73, Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a young Man, a Situation as MANAGER of a small Gas-Work, or as Assistant in large works. Is experienced in every department; can also keep the books, collect the accounts of a Gas Company, and find security to any amount.

Address J. B. B., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

THAXTED GAS-WORKS.

WANTED, a Manager for the Gas- Works at Thaxted, Essex. He will have to make gas, take meters, lay service-pipes, and must be accustomed to take sole charge of a small Gas-Work. Gas and coals provided.

Written application to be made to the Contractors, STEARS BROTHERS & Co., 3, George Street, HULL, stating age, wages required, whether married or single, and giving a reference to last employer.

THE BROMLEY GAS CONSUMERS COMPANY.

NOTICE is hereby given that the ORDINARY GENERAL MEETING of this Company will be held at the Bell Hotel, Bromley, Kent, on THURSDAY, the 28th day of February inst., at Seven o'clock in the evening precisely, to receive the Report of the Directors, the Balance-sheet confirmed by the Auditors, to declare a Dividend, and for general business.

The Transfer Books of the Company will be closed from the 14th day of February inst., until after the meeting. By order of the Board,

GEORGE H. OSBORN, Secretary & Manager.

Offices at the Works, Brick Kiln Lane, Bromley, Kent, S.E., Feb. 8, 1867.

EAST BARNET GAS & WATER COMPANY.

(Incorporated by Act of Parliament.)

OFFICES—61, CHEAPSIDE, E.C., AND ALBERT ROAD, EAST BARNET, N.

NOTICE is hereby given that the ANNUAL ORDINARY GENERAL MEETING of the Proprietors of the Company will be held at the London Tavern on WEDNESDAY, the 27th day of February, at Four o'clock p.m. By order,

WM. C. HUMPHRYS, Secretary.

Feb. 12, 1867.

THE GAS PRODUCTS UTILIZING COMPANY, LIMITED.

NOTICE is hereby given, that the FIFTH ORDINARY GENERAL MEETING of this Company will be held at the London Tavern, Bishopsgate Street, in the City of London, on WEDNESDAY, the 27th inst., at Twelve o'clock at noon precisely, to receive the Report of the Directors for the six months ending the 31st of December last, and to declare a Dividend for the same period.

The Transfer Books are closed till the 28th inst.

By order,

THOS. GUYATT, Secretary.

10, Coleman Street, E.C., Feb. 16, 1867.

TENDERS are Wanted by the Directors of the Aldershot Gas and Water Company, for the PURCHASE of the almost new manufacturing plant of a small Gas-Work, capable of making 3,000,000 feet annually.

A preference will be given to any one taking the whole, which can be seen by applying at the Office, Bank Street, ALDERSHOT.

TO GAS COMPANIES & ENGINEERS.

TO be Disposed of, by the Grantham Gas Company, several lengths of 12-in. CIRCULAR HYDRAULIC MAIN, pierced for 5 retorts, 4-in. dip-pipes and H-pipes; 30 15 in. by 13 in. Ω-mouthpieces, lids, and cross-bars, all in first-rate condition. They are all being dispensed with for larger apparatus.

Apply to the CHAIRMAN of the Grantham Gas Company.

FOR SALE.—8-in. Hydraulic Valve, working 4 purifiers, £20. A PURIFIER, 8 ft. by 4 ft. by 3 ft. 6 in. deep, new cover and sieves, £20. Two PURIFIERS, 4 ft. by 18 in. by 2 ft. deep, 2 valves, covers, connexion, and lifting apparatus complete, £35.

At CUTLER'S, 8, Wharf, Wenlock Road, City Road, LONDON.

FOR SALE, a set of 4 Cast-Iron Dry-Lime PURIFIERS, 10 ft. square and 3 ft. 6 in. deep inside, together with hydraulic centre-valve for 10-in. connexions, and 2 sets of cast-iron girders, 46 ft. 3 in. long, with lifting crabs.

Also a 30,000 feet per hour BEALE'S EXHAUSTER, with 8-in. Walkers' valves.

A 12-in. PARKINSON'S STATION-GOVERNOR.

All in excellent order, and sold in consequence of larger being substituted.

Application to be made to the MANAGER of the Leicester Gas-Works.

FOR SALE.—Nine New Cast-Iron D RETORTS, each 8 ft. long; a large number of RETORT-HOUSE CONNEXIONS, 3, 4, and 5 in.; and a large number of Wrought-Iron LAMP-BRACKETS and STAYS.

Particulars can be had on application to the Cork Gas Consumers Company, Limited, 72, South Mall, CORK.

Jan. 4, 1867.

DEBENTURES.

THE WANDSWORTH & PUTNEY GASLIGHT AND COKE COMPANY.

THE Directors of this Company are prepared to issue DEBENTURE BONDS for £100 each for a period of three years, with interest coupons attached, at the rate of £5 per cent. per annum, payable half yearly. The Debentures will form a first charge on the Company's works and revenue.

Applications for the above bonds to be forwarded to the Offices of the Company, No. 14, High Street, Wandsworth, on or before the 25th day of February instant. By order of the Board,

ALFD. LASS, Secretary.

14, High Street, Wandsworth, Feb. 7, 1867.

TO GASHOLDER MAKERS AND CONTRACTORS.

THE Directors of the Colchester Gas Company are prepared to receive TENDERS for the supply and erection of a GASHOLDER, 120 ft. in diameter and 22 ft. in depth.

Specifications and drawings may be seen, and further information obtained, on application at the Company's Office, Queen Street, COLCHESTER.

By order of the Board,

A. C. FRASER, Engineer and Secretary to the Company.

RETORT SETTING.

MR. JOHN LEACH, 47, Middle Vauxhall, Wolverhampton (late retort-setter for Messrs. J. Eunson and Sons), begs to inform Managers of Gas-Works that he is prepared to ERECT BENCHES and SET RETORTS on the most modern and improved methods, either by piece or day work on moderate terms.

ECONOMY IN GAS PURIFICATION.

Mc DOUGALL'S

HYDRATED PEROXIDE OF IRON.

This Oxide is now well known, and has commended itself for efficiency and durability. It is free from any mixture of sawdust or other material, every particle being available for use, thus causing the Purifiers to work double the time before it requires renewing. It readily takes up sulphur, revivifies rapidly, and lasts longer than any other Oxide in the market. Prices on application to—

ALEX. Mc DOUGALL, Manufacturing Chemist,

LONDON—11, Arthur Street West, London Bridge, E.C.; MANCHESTER—Riga Street, Shudehill.

LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES & FITTINGS,

PLAIN, GALVANIZED, & ENAMELLED, for Gas, Steam, and Water, from ⅛ in. to 6 in. bore.

STOCKS, TAPS, and DIES, GUN METAL GLAND-COCKS, WATER-GAUGES, &c.

PATENT LAP-WELDED IRON TUBES

For Locomotive and Marine Boilers, &c.

LONDON WAREHOUSE—No 66, QUEEN STREET, E.C.

FRASER'S PATENT RETORTS.

THE RIBBED IRON RETORTS

Have now been in use about three years, and continue to give satisfaction. The

PATENT CLAY RETORTS

Will work off the Gas from the Coal in less time, and Carbon does not form in them so freely, nor adhere so firmly, as to Plain Retorts.

Further particulars and prices on application to Mr. A. C. FRASER, Engineer to the Gas Company, COLCHESTER.

JAMES MILNE & SON,

GAS ENGINEERS,

Gas-Meter, Gas Apparatus, and Gasfittings Manufacturers,

EDINBURGH, AND

2, KING EDWARD STREET,

NEWGATE STREET, LONDON.

Station-Meters, Governors, Consumers Meters, Gas Lustres, Chandeliers, Brackets, &c., and every description of Gasfittings and Gas Apparatus.

MARTIN'S

LEE MOOR PORCELAIN FIRE-BRICKS,

Containing no Lime, and only 4·5 of Oxides, resist the strongest heats, and will last for Gas-Works longer than any others.

Samples and prices sent, and the highest references given, on application to

MARTIN BROTHERS,

ST. AUSTELL, CORNWALL.

WALTER FORD,

159, GRAY'S INN ROAD, LONDON.

MANUFACTURER OF WET AND DRY GAS-METERS, STATION-METERS, GOVERNORS, &c. &c.

Sole Manufacturer of **PADDON'S PATENT STREET-LAMP REGULATORS,** for insuring any required consumption. These Regulators are in general and increasing use, and references can be given to Gas Companies who use them for every Lamp.

JOSEPH BOULTON,

80, KING'S CROSS ROAD, AND

10½, GREAT PERCY STREET, CLERKENWELL.

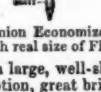
Manufacturer of the Patent Dry and Improved Unvarying Water-Line Gas-Meters and Station-Meters, Governors, Experimental Meters, and Pressure Gauges, on the most improved principle.

Old Meters thoroughly repaired, and altered to meet the requirements of the Act of Parliament.

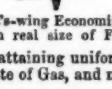
ALL METERS WARRANTED.

PATENT ECONOMIZERS,

ADAMAS-POINTED,



Union Economizer, 1-10th real size of Flame.



Bat's-wing Economizer, 1-10th real size of Flame.

Ensure a large, well-shaped, steady flame. The aperture never wears out, thus attaining uniformity of consumption, great brilliancy of light, freedom from roaring, flickering, or waste of Gas, and no smell of sulphur. One gives more light than a triple-branch ordinary burner.

At the Expense of not quite One Penny for full five hours, a most cheerful light is obtained, surpassing the illuminating power of Twelve best Sperm Wax Lights.

The combustion is perfect; there is no escape of carbonic acid, carbon (or Soot), to discolour the ceiling, or injure the furniture.

All sizes kept in stock, suitable for cannel, mixed, and common gas, plug or taper screwed, to take the place of any old burner.

TESTIMONIAL.

Gas-Works, Portsea, January 2, 1867.

Dear Sirs,—I cordially respond to your invitation to give my opinion of your "ECONOMIZER." We have now not less than 8000 in use, all of No. 8 size, bat's-wing and fish-tails; and in no single instance have they failed to give a brilliant light, well-formed, and unaltered from day to day, with a minimum consumption of gas. Every gas engineer, who has had to struggle with the complaints of his customers, knowing them to arise solely from imperfect combustion of the gas for light-giving purposes, should introduce these burners, and he will find what I have found, universal satisfaction, in place of a great deal of discontent. On the other hand, the consumer will find it to his advantage to CONSUME his gas through this burner, as he will really get the value of what he is paying for. I can affirm with perfect confidence that this Company's consumers who now use this burner would not part with it if it cost six times as much.—I am, dear sirs, yours very truly,

J. DOUGLAS, Superintendent and Secretary, Portsea Island Gaslight Company.

Messrs. Lambert Brothers, Walsall.

LAMBERT BROTHERS, Tube Mills, Gas-Fitting Manufactory,

WALSALL.

Agents supplied with Show-Cards and Tables of Consumption.

BREEZE TENDERS.

THE Phœnix Gaslight and Coke Company are ready to receive TENDERS for taking away all the SMALL COKE or BREEZE from their stations at Bankside and Vauxhall until Lady-day in next year. The quantity will be about 4500 chaldrons, but parties are at liberty to tender for any quantity not less than 500 chaldrons, to be cleared away at periods to be fixed by the Company. The Contractor making a tender will thereby bind himself not to have more than 50 chaldrons on the works at any one time, except at his own risk, upon its sale by the Company, and to pay for the same within one month after each quarter day.

The tender to state price per chaldron of 40 bushels, delivered into craft alongside. It is also to be marked with the words "Breeze Tender" on the cover, and to be delivered at their Office before Twelve o'clock on Wednesday, the 6th of March.

Bankside, London, Feb. 18, 1867.

LIME TENDERS.

THE Phœnix Gaslight and Coke Company are ready to receive TENDERS for the supply of WHITE FLARE BURNT LIME for their stations at Bankside, Greenwich, and Vauxhall, until Lady-day in next year. The quantities will be about 2000 yards. The Lime is to be fresh burnt from the kiln, unbroken, of the best quality, and to be delivered on the stations in quantities as ordered—in barge loads, of 60 or 80 yards, divided between the stations. Payments to be in cash quarterly.

The tender to state the lowest price at per yard by barge, and to be marked with the words "Lime Tender" on the cover, and to be delivered at the Company's Office before Twelve o'clock on Wednesday, the 6th of March.

Bankside, London, Feb. 18, 1867.

THE Directors of the Grantham Gas Company are prepared to receive TENDERS for the purchase of all their TAR and AMMONIACAL LIQUOR produced at their works during the year 1867. The quantity of coal carbonized is about 2500 tons.

Tenders to be addressed to the CHAIRMAN of the Grantham Gas Company.

Grantham, Feb. 14, 1867.

AMMONIACAL LIQUOR.

THE Directors of the Birmingham and Staffordshire Gaslight Company are open to receive TENDERS for the whole of the AMMONIACAL LIQUOR produced at their works at West Bromwich, and at Adderley Street, Birmingham, from the 1st of July next.

Tenders to be sent to the Offices of the Company, Old Square, Birmingham, on or before the 4th day of March next.

Any further particulars may be obtained from the Secretary on application.

By order of the Board,

SAMUEL WALSH, Secretary.

Birmingham, Feb. 12, 1867.

TO MANUFACTURERS

Of Dyeing Agents, Creosote, Heavy Oils, Naphtha, Disinfecting Powder, Compounds of Ammonia, Artificial Manures, &c.

THE Nottingham Gaslight and Coke Company are desirous to receive TENDERS for the purchase of the TAR and AMMONIACAL LIQUOR to be manufactured at their stations, at Nottingham, Radford, and Basford, in the next ensuing period of three or five years, at the option of the Contractor, commencing on the 1st day of April next.

The whole of the works of the Company are alongside public railways, and have branches into them, and the principal station (in the town of Nottingham) is located on the margin of the Nottingham Canal, which communicates with the general system of canals, and also with the navigable river Trent.

The annual quantity of Tar will probably amount to 500,000 gallons or upwards, and the annual quantity of Ammoniacal Liquor will probably amount to 750,000 gallons or upwards.

Intending Contractors will be supplied with forms of tender, on application to the Accountant of the Company, at the Gas Office, at Nottingham, and the tenders must be delivered on or before Thursday, the 28th day of February next.

WILLIAM HUNT, Clerk to the Company.

Gas Office, Nottingham, Feb. 8, 1867.

THE Directors of the Woodbridge Gas and Coke Company, Limited, invite TENDERS for the supply and erection of CONDENSERS and SCRUBBER, sufficient for a make of 2000 feet per hour.

Plans to be forwarded with the price.

TO GASHOLDER MAKERS.

THE Directors of the Preston Gas Company invite TENDERS for a TELESCOPIC GASHOLDER, about 80 feet diameter and 28 feet deep.

Plans and specifications may be seen at the office of the undersigned, to whom tenders, endorsed "Tender for Gasholder," must be delivered, not later than Saturday, the 23rd of March next.

HENRY GREEN, Engineer.

Feb. 15, 1867.

SURREY CONSUMERS GAS COMPANY.

THE Directors of this Company are prepared to receive TENDERS for the COAL TAR made at these works.

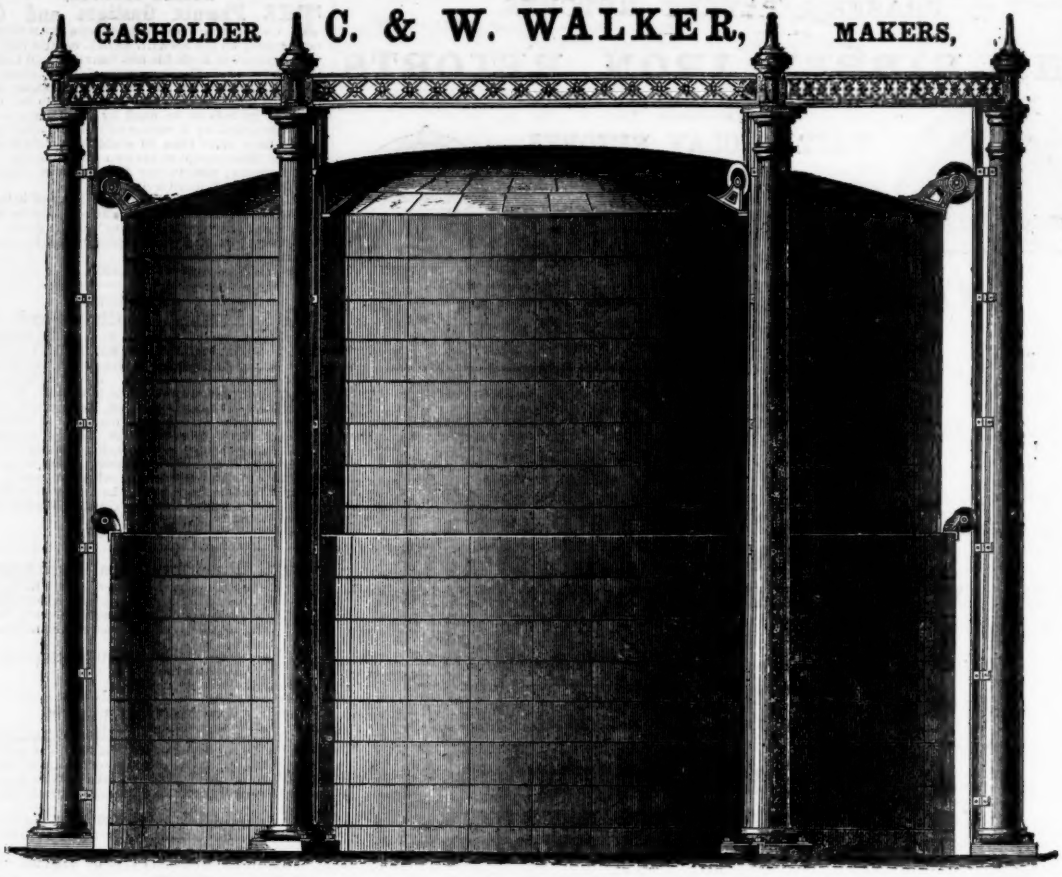
Particulars as to quantity and delivery may be obtained on application to the Engineer, at the Works, Rotherhithe.

Sealed tenders to be sent, addressed to the Secretary, not later than Wednesday, the 27th of February.

W. P. BODDY, Secretary.

Rotherhithe, Feb. 14, 1867.

GASHOLDER **C. & W. WALKER,** MAKERS,



MIDLAND IRON-WORKS, DONNINGTON, NEWPORT, SHROPSHIRE.

TO prevent complaints of inferior Gas, use the best FLINTSHIRE GAS CANNEL.
For contract supply, apply to STRANGE BROTHERS & Co., Gas Coal Merchants, Mold, FLINTSHIRE.

BALANCE-SHEETS AND REVENUE ACCOUNTS.

A FIRM of Accountants, much engaged in the preparation of Gas Companies Accounts, are open to contract for the keeping, balancing, or auditing the books of other Companies, which, from their experience, they are enabled to do on moderate terms.
Address, SANDELL & MADDERS, Accountants, 4, Skinner's Place, Size Lane, LONDON, E.C.

ROBERT MACLAREN and CO., EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

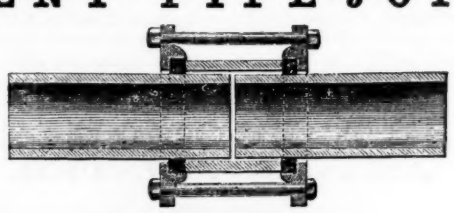
GREENSHIELDS' PATENT COMPOUND
FOR
PRODUCING GAS AND COKE.

The Subscribers are now prepared to grant LICENCES by Bonus and Royalty to Gas Companies and others for making and using the above Compound, which Compound is considerably cheaper than the best gas coals, and is capable of being made to produce from 12,000 to 15,000 cubic feet of gas per ton, as required, with an illuminating power of great brilliancy and purity, and leaving a coke in every way suitable for fuel.
Further particulars may be learned on application to JAMES GREENSHIELDS & SON, 33, Virginia Street, GLASGOW.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.
Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.
Patents procured for Foreign Countries.
Information as to cost, &c., supplied gratuitously upon application to the advertiser, 42, Parliament Street, WESTMINSTER. [Office of the JOURNAL OF GAS LIGHTING, &c.]

DR. NORMANDY'S
PATENT PIPE-JOINTS.



SOLE MANUFACTURERS—
A. NORMANDY and CO., Engineers and Ironfounders,
HOLLY BUSH PLACE, BETHNAL GREEN ROAD, LONDON, N.E.

Also Sole Manufacturers of the Patent Marine Aërated Fresh-Water Apparatus, Steam Pumps Steam Winches, &c.
These Joints have been in use nearly three years on gas-mains, and are still perfectly sound. They have also been proved quite sound under a pressure of 680 feet head of water.
The advantages which these Joints offer are economy, perfect soundness and durability, ease and rapidity of application, use of perfectly plain pipes, so that a tight Joint may be made with cut pipes, even though the ends do not come close together. Any ordinary labourer is capable of securely fixing them.
These Joints are particularly applicable to gas, water, and suction pipes, and remain permanently sound; they are cheaper than the socket-joint, as they save the lead, the gasket, the iron forming the socket (which in a 3-inch main amounts to 10 lbs.), and the fire for melting the lead. There is also considerable saving of time, more than four Joints being made in the time required for making only one of the others, and by unscrewing the bolts, a pipe can be removed and replaced with the greatest facility.
By means of these Joints, which are made of all sizes, pipes made of either wrought or cast iron, copper, lead, tin, earthenware, glass, bitumen, gutta-percha, suction-hose, &c., may be rapidly and soundly united, and taken apart with facility.

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ESTABLISHED **1840.**
JOHN EUNSON AND SON,
GAS ENGINEERS, AND MANUFACTURERS OF CLAY RETORTS,
AND FIRE GOODS IN GENERAL,
WOLVERHAMPTON.
Retort Mouthpieces, Bolts, Nuts, and every description of Wrought-Iron Work.

KIRKWOOD CANNEL COAL.
This Coal is largely used in the Gas-Works at Glasgow, Paisley, Port Glasgow, Edinburgh, Leith, and many other towns throughout Scotland. It yields 10,618 cubic feet per ton; illuminating power, 27·55 standard candles; coke per ton, 9 cwt. 83 lbs. Railway communication from the pits (at Coatbridge) to all parts of the country; ports of shipment in Firths of Forth or Clyde.
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WILLIAM FRASER, Inverkeithing
(owner of the Works at which Fire-clay Retorts were first made), having greatly enlarged his works, can supply retorts and other fire-clay goods to any extent.
References can be given to managers of above a hundred Gas-Works whom he supplies.
WILLIAM FRASER ships COWDENBEATH PARROT COALS at Charlestown and Burntisland at 11s. per ton; and HALBEATH STEAM COALS, on Navy List, at 8s. 6d. per ton.

JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,
Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water-Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.
N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.
CHARLES HORSLEY, Agent.

OXIDE OF IRON,
We are prepared to supply, on moderate terms,
HYDRATED PEROXIDE OF IRON (BOG OCHRE),
Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.
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BELFAST.

INTERNATIONAL EXHIBITION, 1862. CLASS X.
PRIZE MEDAL
For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.
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THROCKLEY,
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MANUFACTURERS OF
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SCOTSWOOD FIRE-BRICK WORKS,
NEAR
BLAYDON-ON-TYNE.

ADDISON POTTER,
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Manufacturer of Clay Retorts, Fire-Bricks, and every description of Fire-Clay Goods.

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BEST CLASS-HOUSE POT AND CRUCIBLE CLAY
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AMBLECOTE FIRE CLAY AND BRICK WORKS,
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Late in the occupation of I. and W. King. Originally J. Pidcock, Esq.
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D's, 16×12, 15×14, 20×16, 16×18.

HANCOCK'S INDIA-RUBBER GAS-TUBING.
All sizes, from ¼ in. to 4 in. diameter and upwards.
Also,
HORSE SINGEING APPARATUS, best make, with GAS-BURNERS, COMBS, and INDIA-RUBBER TUBING, all complete.
INDIA-RUBBER BAGS for GAS-MAINS.
WASHERS for GAS and STEAM JOINTS.
VALVES (pure solid Rubber) for STEAM-ENGINES.
PACKING (Elastic) for STEAM-ENGINES.
FLANGE TUBING, for excluding Draughts and Dust through WINDOWS, DOORS, and GLASS CASES.

Section.
Illustrated Price Lists on application.
JAMES LYNE HANCOCK,
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Patentees and First Makers of Wrought-Iron Tubes.

MR. G. W. STEVENSON, C.E., F.G.S.,
(for the last 10 years Engineer to the Corporation of Halifax), may be consulted upon all matters connected with the construction of gas-works, and the manufacture and supply of gas; also upon the construction of water-works and the supply of water to towns; and also in respect to the sewerage of towns, and sanitary works generally.
OFFICE: 14, Park Street, WESTMINSTER.

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Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.
Plans, Specifications, and Estimates prepared.

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SOCKET, FLANGE, HOT-WATER PIPES, AND ALL CONNEXIONS; RETORTS, HYDRAULIC MAIN, LAMP-COLUMNS, &c.; AND EVERY DESCRIPTION OF CASTINGS AND WROUGHT-IRON-WORK FOR GAS AND WATER-WORKS, STEAM, AND GENERAL PURPOSES.
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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
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J. SUGG and CO., late ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.
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Brass and Iron Gas-Fittings, Steam and Water-Cock &c., &c.
Also,
PATENT WELDED IRON TUBES,
For Gas, Steam, Water, and other purposes.
GAS APPARATUS OF EVERY DESCRIPTION.
High-pressure Water-Valves and Cocks, &c., &c.
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FIRE-BRICKS, LUMPS, SQUARES, and TILES of all dimensions.
GAS-RETORTS always in stock.
GARDEN EDGINGS of various patterns.
ORNAMENTAL BUILDING BRICKS.
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Contracts entered into to set Retorts, erect Furnaces, &c.
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SOUTHWARK, LONDON, S.E.,
DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for
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Works: 14, John Street, Pentonville Road, LONDON, N.
The above sieves are used by the principal gas companies in London and the country. Their utility, durability, and cheapness combined, render them superior to all others.
Testimonials from gas engineers who have tested their qualities forwarded on application.
All orders punctually attended to, and estimates given if required.

CAST-IRON Retorts, Socket Pipes, with Syphons and all requisite Connexions, Lamp Columns, Wrought Iron Tubing, Valves, Street Lamps, Sight Holes, Furnace Doors, Ash Pans, Charging and Coke Shovels, Iron Pails and Coke Barrows, Cross Bars, Fire Pots, Pumps, Iron Borings.
PURIFIERS, CONDENSERS, and SCRUBBERS erected complete, or the materials supplied; with every description of goods in use by Gas-Works, in stock, on wholesale prices, at
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For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.
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Main Laying and Gas-Works erected complete.

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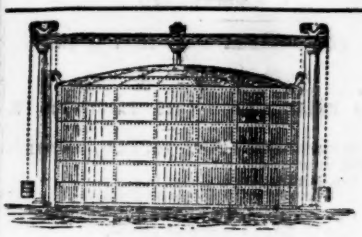

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PLANS of the IMPROVED ANNULAR CONDENSERS;

PLANS of the COMBINED PURIFYING APPARATUS, so eminently adapted for Exportation.

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GAS ENGINEER,

is removed to his New Factory,

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WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

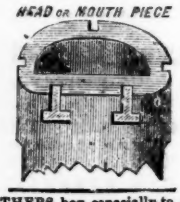
GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.'s Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N. B.—*Export orders continue to have prompt attention.*

KING BROTHERS,

STOURBRIDGE FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

Retort Ovens, Fire-Bricks, Guards, Saddles, Rabbitted Bars, Flues, and Quarries, are all Manufactured of the same quality of Clay.

Every Retort and Brick is branded "King Brothers, Stourbridge."

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NEW CITY SHOW-ROOMS AND MANUFACTORY, 147, HOUNDSDITCH.

TO GAS COMPANIES & THE TRADE.

J. DEFRIES & SONS,

GAS ENGINEERS,

AND MANUFACTURERS OF

CRYSTAL, BRONZED, & ORMOLU CHANDELIERS;

IMPROVED CRYSTAL STAR AND SUN LIGHTS;

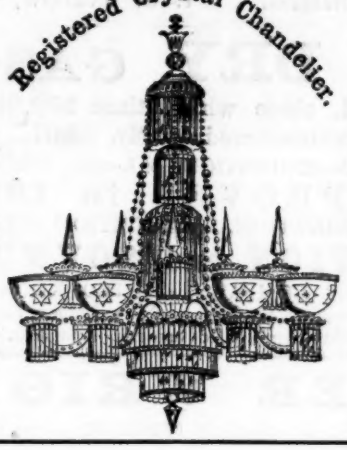
VESTIBULES,

AND

EVERY DESCRIPTION OF GAS-FITTINGS.

WORKS:

LONDON, BIRMINGHAM, & PARIS.



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Beg most respectfully to inform Gas Companies and the Trade that their

NEW CITY SHOW-ROOMS

Are now complete with every description of Lighting Mediums, including Registered Designs of Mediæval Gas-Fittings, Crystal, Bronzed, Ormolu, and Electro-Plated Chandeliers, Brackets, Vestibule-Lights, Bronzed and Gilt Statuettes.

Special Designs prepared in perfect accordance with architectural arrangements. Estimates furnished for the Lighting and Fitting up of Theatres, Music-Halls, and Public or Private Buildings with Gas.

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THE PATENT GAS-REGULATOR & PURIFIER

Reduced to 6s. 6d. per Dozen.

Pattern Books of Gas-Fittings, Crystal and Ormolu Chandeliers for 1866-67, are now complete.

WORKS:

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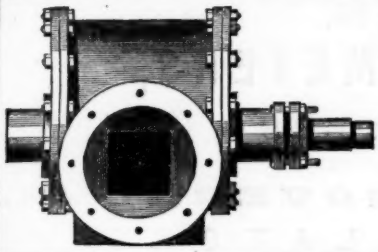

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with many recent improvements, from 1500 to 150,000 cubic feet per Hour.

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efficient and durable TAR, LIQUOR, and SYPHON PUMPS,
GAS-VALVES, with or without Wedges, worked with powerful Worm and Rack,
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RETORT SETTINGS, heated by tar without the production of smoke.
STEAM-ENGINES and EXHAUSTERS, separately or combined.
FOUR-WAY VALVES, one of which is equal to three ordinary Valves.
STATION GOVERNORS in which the Gasholder cannot tilt and cause accidents.

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GAS-METER COMPANY, LIMITED,
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CROLL'S DRY GAS-METER,
(Invented and Patented in 1844, since which time 200,000 of these Meters have been manufactured by Mr. CROLL,)
Obtained PRIZE MEDALS at the EXHIBITIONS of London, 1851, of New York, 1853, and Paris, 1855.
IMPROVED in 1858,
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Now manufactured by the GAS-METER COMPANY, LIMITED, KINGSLAND ROAD, LONDON; and, for the purpose of obtaining greater accuracy in all its parts, the most perfect machinery has been adopted, "By which the construction of the Meter is much simplified, while its liability to get out of order is diminished." (See report of T. G. BARLOW, Esq., C.E.)

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COMPENSATING WET METERS,
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IMPROVED DRY METERS
of the very highest excellence.
STATION-METERS AND GOVERNORS.
STREET-LAMP REGULATORS.
TESTING APPARATUS
of the most perfect description for all purposes relating to Gas.
KEELING'S PATENT STATION-GOVERNOR REGULATOR.

55 and 55a, MILLBANK STREET, WESTMINSTER, S.W., and COPENHAGEN.

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invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.
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